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Educational News and Editorial Comment

A SIGNIFICANT VOLUME ON NATIONAL SYSTEMS OF EDUCATION

Beginning in 1932, Lord Eustace Percy, former president of the Board of Education in England, began the publication of a series of volumes entitled *The Year Book of Education*. Each of these volumes contains a vast amount of factual information with respect to the educational systems of the United Kingdom, the British Commonwealth of Nations, and other countries throughout the world. The editor of these yearbooks does not, however, confine himself to a mere compilation of facts; he and his collaborators have attempted the more ambitious task of interpreting their data. The result is that these yearbooks constitute an exceedingly worth-while continuing encyclopedia of education.

American readers will be especially interested in the volume for 1934. The following introductory statement by Lord Percy indicates something of its content.

> Part I of this volume . . . . attempts the ambitious task of outlining the educational systems of all countries. The United Kingdom is treated at length; the Dominions and the United States in a more condensed manner, but still with some attempt at statistical detail; and foreign countries in a nec-

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essarily more summary fashion. The introductory chapters to the first and second sections of Part I attempt some interpretation of these educational systems. In Section III of this part an experiment has been made in the construction of certain comparative diagrams of education in leading British and foreign countries. For the rest, this part contains the usual chapters on the finance and law of education in the United Kingdom, supplemented by a detailed survey of educational expenditure in Scotland during the past twelve years, on the same lines as the similar survey of English educational finance in the volume for 1932. The summaries of education in the British Dominions and in the United States are admittedly fragmentary as compared with the United Kingdom chapters, a defect which we shall hope to remedy in the future; but the inadequacy of the Dominion summaries is to some extent made good, as we shall see, by the chapters in Section I of Part II.

Having thus, as it were, made good and completed the framework of facts in Part I, the Year Book proceeds in Part II to describe current events and to survey certain special features of education. Section I of this part summarizes events in the English-speaking nations during the last year or two, with special reference to the economic depression. This is followed by a more ambitious survey of one special subject, namely, secondary education in the English-speaking nations. This survey covers in more or less detail secondary and, to some extent, other forms of post-primary education in England and Wales, Scotland, Canada, and the United States. . . . .

Section III may be regarded as a first rough and hesitating attempt to focus educational problems in terms of the revolutionary change which appears to be taking place in the conditions of Western civilization.

Section IV represents another new departure. It is an attempt at a detailed survey of a particular administrative problem: the arrangements in force throughout the British Empire for regulating the use of textbooks in schools maintained or aided by the state. For the information contained in this section we wish to express our particular indebtedness to the Departments of Education in all parts of the British Empire who have responded most generously to the inquiries addressed to them.

The remaining sections proceed on the lines of previous volumes. Omissions in those volumes are made good, as in the chapters on religious education in Scotland, music in English elementary schools, and the South African universities. The survey of education in the British Colonies is extended to Jamaica and British Malaya, and the survey of education in foreign countries to Spain, Austria, Finland, and the Catholic schools of France. The Spanish chapter may be regarded as taking its place in the series of studies of revolutionary education which has included, in previous volumes, Italy, Turkey, and Soviet Russia. The Austrian chapter may prove of particular interest as an authoritative and up-to-date account of a "democratic" experiment which has attracted particular attention since the war.

A Comparison of School Attendance in the United States and Certain Other Countries

The Year Book of Education, 1934, to which attention was called in the preceding paragraphs, contains a body of significant information in diagrammatic form with respect to school attendance in a number of leading nations of the world. The factual data exhibited in the most significant of these diagrams are herewith presented, the diagrams being reduced to tabular form for convenience of presentation. The reader will appreciate the many difficulties involved in gathering comparative statistics of the type presented here. In *The Year Book of Education, 1933,* the reader was cautioned with respect to the qualifications which should be borne in mind in studying the diagrams, and the caution is repeated in the *Year Book* of 1934. Nevertheless, it is felt that the data are sufficiently reliable, for purposes of general comparison, to give a fairly accurate picture of certain aspects of school attendance.

One of the striking facts revealed in Table I is the great variation in school attendance of the three-to-seven age group. Evidently, preschool education is most highly developed in France and in those countries under French influence, such as Belgium, Holland, Italy, and Switzerland. There is considerable variation, too, in the percentages of pupils in the seven-to-fourteen age group attending school —more variation perhaps than one would have expected. But it is in the fourteen-to-eighteen age group that the most striking and significant variations occur. According to the figures here given, 33 per cent of the youth of this age group in the United States are in full-time school attendance, whereas the corresponding figures for England, France, and Germany are 16, 8, and 16, respectively. It seems likely, moreover, that the figures for the United States are too low. On this point exact statistical data do not seem to be available, but the Census of 1930 shows that 73 per cent of all youth aged fourteen to seventeen, inclusive, were attending school. Unfortunately, the Census figures do not differentiate between full-time and part-time attendance. The figures in Table I also reveal the extensive development of part-time continuation education in Germany and in certain countries under German influence.

Table II reveals the striking growth of secondary-school enrolment during the period from 1914 to 1930. It is obvious that most of the nations of the world are developing a more liberal policy with

TABLE I

PERCENTAGE OF YOUNG PERSONS ATTENDING SCHOOL IN THE UNITED STATES AND CERTAIN OTHER COUNTRIES IN SCHOOL YEAR 1930–31

COUNTRY	PERCENTAGE OF YOUNG PERSONS ATTENDING SCHOOL			
	3–7 Years of Age	7–14 Years of Age	14–18 Years of Age	
			Full Time	Part Time
United States	10	96	33	12
Austria	35	99	13	14
Belgium	74	99	20	13
Bulgaria	2	85	10	2
Czechoslovakia	30	90	8	20
Denmark	2	92	6	10
France	65	87	8	6
Germany	36	99	16	51
Greece	23	62	10	0
Holland	64	94	13	35
Hungary	43	88*	12	14
Italy	50	62	4	0
Japan	28	88	12	12
Norway	2	97	11	7
Poland	5	95	8	5
Russia	2	72	15	12
Spain	18	76	6	0
Sweden	2	96	14	38
Switzerland	62	99	20	45
England and Wales	50	99	16	15
Scotland	41	100	20	21
North Ireland	20	99	20	10
Irish Free State	45	90	25	15
Canada	11	100	30	15
Australia	20	94	26	8
New Zealand	33	95	30	10
British India	9	12	3	0

* In Hungary 16 per cent of the children in the seven-to-fourteen age group are in part-time attendance

respect to the secondary education of their youth. A comparison of enrolment in the United States with that in other countries indicates in a most impressive way the unique character of American secondary education. It will be noted that for each 10,000 of the population the secondary schools of the United States enrol a great many

more pupils than do schools of like grade in any other nation, the figures for 1930 being, for example, 424 for the United States, 316 for Scotland, 245 for Australia, 241 for Canada, 156 for England and Wales, and 45 for France. In making deductions from these figures, the reader is again cautioned not to overlook the fact that in some

TABLE II

NUMBER OF PUPILS PER 10,000 INHABITANTS IN GENERAL SECONDARY SCHOOLS IN THE UNITED STATES AND CERTAIN OTHER COUNTRIES IN THE YEARS 1914, 1920, 1925, AND 1930

Country	1914	1920	1925	1930
United States	141	298	349	424
Austria	.....	60	67	78
Belgium*	28	35	37	33
Czechoslovakia	.....	74	74	64
Denmark	100	113	137	140
France*	35	39	43	45
Germany	97	125	134†	.....
Holland	32	37	43	54
Italy	21	24	25	36
Norway‡	100	102	109	90
Poland	.....	74	75	66
Russia	38	43	52	25
Spain	25	25	31	27
Sweden	87	120	121	119
Switzerland	68	66	77	82
England and Wales§	90	134	141	156
Scotland§	102	217	300	316
North Ireland	.....	52	60	76
Irish Free State	.....	70	76	92
Canada‖	152	159	188	241
Australia¶	113	139	166	245
New Zealand	86	117	146	166
British India	21	25	37	34

* Public schools only.
† Data for 1926.
‡ Ages fourteen to twenty.
§ Includes preparatory schools.
‖ Includes preparatory schools in Quebec.
¶ Includes junior technical schools.

countries the secondary schools enrol pupils who in other countries would be enrolled either in the elementary schools or in the colleges.

Table III indicates that during the past two decades most countries have had steady but relatively slow increases in the percentage of the population in attendance at universities and higher technical schools. However, in certain countries, among them the United States, there are striking exceptions to this general tendency, the

percentages of increase being approximately 165 in the United States; 175 in North Ireland; 143 in Russia; 129 in Holland; 100 in Germany, Norway, and Canada; and 90 in Spain.

TABLE III

NUMBER OF STUDENTS PER 10,000 INHABITANTS IN UNIVERSITIES AND HIGHER TECHNICAL SCHOOLS IN THE UNITED STATES AND CERTAIN OTHER COUNTRIES IN THE YEARS 1914, 1920, 1925, AND 1930

Country	1914	1920	1925	1930
United States*	27	52	61	71
Austria	.....	43	34	34
Belgium	15	17	16	20
Czechoslovakia	.....	21	21	24
Denmark	11	10	12	11.5
France	11	14	14	18
Germany	11	23	17	22
Holland	7	9	11	16
Hungary	15	18	18	18
Italy	10	18	12	12
Norway	6	6	9	12
Poland	.....	12	13	16
Russia	7	16	12	17
Spain	10	11	14	19
Sweden	11	12	13	14
Switzerland	22	26	23	27
England and Wales	7	10	11	11
Scotland	20	33	29	31
North Ireland	4	8	9	11
Irish Free State	7	11	10	12
Canada*	26	35	32	51
Australia	8	11	13	14
New Zealand	22	33	34	35
British India	2	2.5	3.5	3.5

* Junior colleges included in the United States and Canada.

THE RESTORATION OF SALARY SCHEDULES IN SEATTLE PUBLIC SCHOOLS

The Board of Education of Seattle has made public the following official statement with respect to the partial restoration of salary schedules which it has recently put into effect.

By unanimous vote, the board has directed, effective with the school month of February and payable on March 5 and succeeding monthly pay days, that a partial restoration of salaries and wages be made to all employees of the school district. This action will restore to educational salaries for the balance of this fiscal year approximately one-half the amounts by which they have been re-

duced below last year. It is further provided that no teacher shall be paid for the balance of this fiscal year at a rate of less than $1,200 per annum. The action will also increase the compensation for members of the business-department staff by approximately 10 per cent above the present rates. The rate of increase in both departments is approximately the same, the different methods of application being due to a difference in schedules. At the same time the board specifically reserves the right to determine its wage and salary policy for next year in the light of revenue estimates at the time the budget is formulated, believing that it will continue, as in the past, to retain the confidence of the school staff in the determination of such policy.

When the budget for the current year was adopted last April, the board realized that it was confronted with a drastic decline in school revenues which had to be recognized by corresponding reduction of expenditures if the schools were to continue to operate without interruption. Because approximately 80 per cent of the outlay for school operation is necessarily devoted to salaries and wages, it was inevitable that the greatest burden of retrenchment should fall upon the school staff. Accordingly, salaries and wages for all employees of the school district were again reduced, the aggregate representing a downward adjustment more severe than those which were made in comparable lines of public service and in many other city school systems of the country.

While the board deeply regretted the necessity for this action, the results have been apparent in marked improvement in the financial condition of the school district. Expenditures have been held within the amounts budgeted, and receipts have fortunately been in excess of expectations at the time the budget was made.

The spirit of the entire school staff in carrying on has, in a large measure, the board believes, protected the children of Seattle from impairment of school efficiency under conditions of severe retrenchment. This loyalty offers additional reason for carrying out the board's intention expressed last spring at the time the budget was formulated of relieving the severity of reductions in compensation as soon as revenues were such that this could be done without impairing the continued improvement of the district's finances, which the board considers absolutely essential.

The board believes its action in making an upward adjustment of compensation at the present time to be in line with the general movement toward recovery, and takes pleasure in the fact that the co-operation of its entire staff has made such an action possible.

The Unique Building Problem of California Schools

As a result of the earthquake at Long Beach, a unique situation has developed in California with respect to school buildings. The legislature of that state has passed a statute, popularly known as the Field Bill, which attempts to eliminate earthquake hazards by re-

quiring all school buildings to conform to certain prescribed standards. At the present time the plants of the school systems are in the process of examination by the State Division of Architecture, and the school authorities are finding it necessary to house a great many pupils in temporary quarters until they are able to provide adequate permanent buildings for their pupils. Approximately 95 per cent of the pupils of Long Beach are housed in canvas tents and temporary wooden structures. Los Angeles is spending somewhat more than a million dollars for temporary accommodations for its pupils. Berkeley has found it necessary to accommodate three thousand pupils in canvas tents and temporary wooden buildings and to spend in excess of $50,000 in purchasing this temporary equipment and in having building surveys and estimates made. The disorganization and the expense entailed in carrying the provisions of the law into execution are unfortunate at this particular time, but neither the state legislature nor the school authorities could escape the responsibility of safeguarding the lives of the school children of the state.

The Organization of Effective Instructional Materials on the Problems of Taxation

Students of public finance have frequently pointed out in no uncertain terms the injustice and the inefficiency of the system of taxation which prevails in the great majority of the American states. During the past few years almost every American community has experienced difficulty in maintaining anything like adequate public services, and that difficulty has been chargeable in large measure to the system of taxation employed in raising the public revenue. It is perfectly patent that the tax base which we are employing today is unable to support the expanding structure of government enterprise. Nevertheless, tax reform is particularly difficult, and it will remain difficult until the average citizen has some understanding of the elementary principles of taxation.

Obviously, taxation is a matter which the schools have too long neglected. The probable reason for this neglect has been that adequate instructional materials have not been available. There is real need for a treatment of the relation of taxation to organized society in such simple form that it can be made the basis of instruc-

tion in both the upper grades of the elementary school and in the high school. Such a treatment might well begin with the simplest forms of social organization and show how even in the most primitive societies the individual is called on to make personal sacrifices for the welfare of the group. It should show how in different places and in different times the individual has been required to support in some measure such public enterprises as were deemed indispensable for the public welfare. As the more modern period is reached, attention should be centered on the forms of taxation in operation in the pupil's own community and in other communities. In this way an attitude could be built up in the pupil which would cause him to regard the payment of taxes not as a thing to be avoided where possible but as a duty which he owes to society. The pupil would be brought to see that taxation is merely an instrument which society employs to purchase goods and services for the individual in a more economical and effective way than he can purchase them for himself. The study of the history of taxation as a social institution would show the pupil how the increasing complexity of society necessitates a larger expenditure for public services. He could be brought to realize too that it is absolutely necessary for every citizen to assume responsibility for the justice and equity of the tax system and for the proper and honest expenditure of public funds.

A brochure has recently been published which makes a real contribution to the study of the problems of taxation along the general lines suggested in the preceding paragraph. It was sponsored by the Committee on Taxation of the Northern Illinois Conference on Supervision and was prepared by Professor Walter Wellman Cook, of the Eastern Illinois State Teachers College. The following quotation from the Foreword indicates the purposes that the committee had in mind in having the brochure prepared.

> It is probable that since the Boston Tea Party unjust taxation has been the cause of more political commotion in the United States than any other cause. Despite this fact, very little attention has been given to the subject in our public elementary and secondary schools. Taxation has been considered a difficult subject, to be dealt with only in college classes in economics and political science. As a result of this policy few people understand the interrelations of government, taxation, and the economic life of the people. Few people know what taxation is and what the essential principles of just taxation are. It is probable that rela-

tively few people in Illinois know the different forms of taxation used in the state, and which of these forms are considered just, and which are considered questionable. When the people of a democratic state fail to understand the fundamental problems of government which taxation presents, the result is likely to be an unjust distribution of the costs of government, political corruption, the wasteful spending of public money, the curtailment of essential governmental services, and governmental bankruptcy.

This brochure was sponsored by the Committee on Taxation of the Northern Illinois Conference on Supervision in the conviction that a wider knowledge of the facts regarding taxation on the part of pupils in the upper grades and high schools throughout Illinois will result in less political commotion and more progress in the establishment of a just system of taxation in the future than in the past.

The brochure is written in clear, simple language which can be understood by upper-grade and high-school pupils. A chapter is devoted to each of the following topics: the development of governmental services and taxation, the history of taxation in Illinois, the tax system of Illinois, the administration of the general property tax in Illinois, the control of local governmental expenditures in Illinois, and summary and recommendations. This brochure should be made available for every upper-grade and high-school pupil in Illinois. It should, moreover, prove suggestive to school people outside Illinois who may be interested in organizing concrete instructional materials on the problems of taxation in their respective states. The brochure is entitled *The Tax Problem in Illinois* and may be secured from George E. Thompson, superintendent of schools, St. Charles, Illinois. The price is fifteen cents.

Making the Curriculum Contribute to Social Understanding

The Citizens League of Cleveland, through its Schools Committee, has recently made a survey of citizenship training in the Cleveland public schools. The committee's discussion of the need, the purposes, and the methods of citizenship training is so lucid and pointed that it warrants quoting at some length.

Never in the history of the country was there greater need of substantial groundwork in the facts of government and politics, and the ethical principles underlying good citizenship, than at the present. The future citizen coming out of American schools and colleges finds himself in the midst of a highly mech-

anized industrial world, progress in which has far outstripped the political and governmental machinery set up to control and govern such industrial development. He finds himself surrounded by a social environment which has almost completely changed, even while he was getting his education. He is confronted with economic conditions which defy governments and economic laws; and as he leaves school and college he is told that he is on the threshold of the greatest social and economic change the country has ever known. Yet he goes out into this changing world without even the educational foundation for understanding and interpreting the political problems facing him as a citizen. . . . .

Most school authorities used to regard the obligation of citizenship training as having been fulfilled when the student, at some period in his course, was made acquainted with the facts relating to the formation and development of the Constitution and the forms of local government. But even in those cases where elementary courses in economics and sociology were taught, the presentation of the facts was usually most incomplete. Whole phases were left out entirely. For example, the student was not made acquainted with the practical operation of politics and government, the wrong methods used to elect favored candidates, the hidden influences at work to lead public officials to betray their trust, the subtle use of propaganda camouflaged as fact by well-organized special interests, and the extent of party-organization control by corporate wealth. These facts are as much a part of the economic, political, and social history as are the facts regarding the framework of the Constitution and the organization of the administrative departments for carrying on the functions of government.

Moreover, most modern educators are beginning to realize that it is not enough merely to supply the pupil with information about government and society. He must be inspired to be a worthy member of the social order and to participate actively in the duties of citizenship. As John Ruskin has said: "Education does not mean teaching people what they do not know. It means teaching them to behave as they do not behave." It means educating the pupil for, and training him in, citizenship and not merely telling him about citizenship.

Citizenship is an art, and its practice requires training. It involves an ideal which must be made a part of the character of students, and not merely a part of their understanding. . . . .

It follows then that our education for citizenship must be twofold: (1) It must prepare the individual for a useful occupation; and (2) it must prepare him to participate in government, either actively as an office-holder or indirectly through the choice of those who govern.

The full program of social education which this view of citizenship entails would involve the whole curriculum from kindergarten to college and more. It would call upon many agencies outside the public schools, such as the home, the church, the political and commercial associations, to share the task. The public school alone cannot support the whole burden of this social education; but there is a very important rôle which it must assume, and the public-school curriculum

must make provision for fulfilling its function adequately. It involves, we believe, three things; first, instruction in social facts and principles; second, inculcation and stimulation of the ideals which are inseparable from democratic government; and, third, actual practice in the arts of self-government. . . . .

In other words, training in citizenship consists, as someone has said, of the triple purposes; *information*, *inspiration*, and *participation*. Citizenship training which has merely acquainted the pupil with the facts regarding government and society has largely failed. It must instil in him a desire to be a worthy member of society and also create in him a sense of responsibility which will be satisfied only by his personal participation in the government under which he must live and work. . . . .

Citizenship training with only the practice side adequately developed is, however, only partial citizenship education, which does not adequately equip the future citizen to cope successfully with the difficult economic, social, and political problems of an industrial age. These problems are entirely too complicated to be solved merely by practice in co-operation, important as that practice is. Skill in co-operation is good, in fact, essential; but it must be supported by a knowledge of history—how people and nations have lived and progressed; what effect geography and physical environment have had on civilization; how economic laws operate in an industrial society; how nations become dependent upon each other as distances are wiped out by modern means of transportation and communication; how interdependent the people of all nations and parts of the world have become through trade and travel; how important a part culture and leisure play in the modern world; what are the forces and influences at work all the time to prevent the progress of citizenship ideals; and those other features so essential a part of the knowledge of the world about us. We realize that a comprehensive knowledge of all of these facts and subjects cannot be taught in the public schools; but the pupils can at least be made acquainted with the rudiments.

But even the fact content and the practice in co-operation are not enough. True citizenship involves other elements, ideals, attitudes, and habits—those elements of character which, supported by information, lead the pupil to a life of eager service and responsibility in the community in which he lives. These habits and attitudes can be inculcated only by a consistent, continuous, and well-planned course of citizenship education continuing throughout the school course.

If the public-school authorities of the country could be brought to realize fully the effect on public opinion of such a well-rounded course in citizenship training, and could be brought to give such training the prominence in the curriculum which Horace Mann and other educational statesmen believe it should have, one generation of such training would work a revolution in our whole public attitude toward government and politics.

The trouble has been as Walter Lippmann points out that: "Democracy has never developed an education for the public. . . . . It has not taught the child

how to act as a member of the public. . . . . The result is a bewildered public and a mass of insufficiently trained officials. . . . . The public at large has had no coherent political training of any kind. Our civic education does not even begin to tell the voter how he can reduce the maze of public affairs to some intelligible form."

With respect to citizenship training in the Cleveland public schools, the league's Schools Committee makes the following recommendations:

1. The appointment by the Board of Education of a fairly large committee composed in part of well-trained and experienced teachers in this field of work and in part of citizens outside of the teaching staff, to make the necessary surveys and undertake the task of preparing a course of social studies for all grades in the public schools.

2. The employment by the Board of Education of a well-trained and experienced person who can direct the surveys and do the detailed work in developing such a course of social studies.

3. The assignment to this social-studies committee of the following specific tasks: (*a*) to investigate the social-study courses and citizenship work in the leading school systems of the country; (*b*) to examine into the extent of student participation in school government and activities in the school systems of the country; (*c*) to develop a course of social studies for all grades of the public schools; and a plan for co-ordinating, in so far as practicable, all of the extra-curriculum activities and integrating them with the social studies; (*d*) to work out a plan of effectively utilizing the facilities of public offices and community organizations as laboratory material in citizenship education; (*e*) to work out a plan by which adequate observance of patriotic holidays, granting of civic honors, etc., can be conducted as a means of developing citizenship ideals; (*f*) to investigate the devices which will motivate social activity and fit them into the educational process; (*g*) to devise a plan by which there may be a continuous collection and preparation by the public, reference, and school libraries of material for use in citizenship-training work.

4. The committee should evolve plans and provisions for the adequate training of teachers to prepare them for the teaching of these social-studies courses.

5. The direction of such a continuing course of social studies should be placed under the supervision of a thoroughly trained and experienced director who will devote his entire time to supervision of social-studies or citizenship-training courses.

But a carefully planned and modern social-studies course will not of itself accomplish the desired results. There must be a corps of teachers well trained in history, sociology, and political science, and under expert supervision, who will be able to utilize not only their broad knowledge in teaching but all of the facilities of the community in illustrating the practical side of citizenship relations.

A social-studies committee as suggested will have the advantages of a number of recently well-developed courses of studies in other cities; and also the reports, soon to be issued, of the Commission on Social Studies sponsored by the American Historical Society and the Political Science Association and composed of some of the foremost political scientists and educators in the country.

The introduction of a well-developed course of citizenship training in the twelve grades of the public schools will not mean a large addition to school costs. The teaching staff will have to be increased only in the supervision. The same teachers (with some intensive training) will teach these courses as they teach other courses.

We feel that this primary function—training in and for citizenship—of the schools should be no longer neglected in Cleveland. For that reason we are urging the Cleveland Board of Education to take immediate steps to create a committee of teachers and citizens as suggested above, so that it can proceed at once to the consideration of this important matter of citizenship education.

The Use of Visual Aids in the Teaching of Geography

In a recent number of *Pittsburgh Schools*, Frank M. Gatto, assistant director of the Department of Curriculum Study and Educational Measurement and Research in Pittsburgh, reports the results of two experiments in the use of visual aids in the teaching of fifth-grade geography. The general purpose of these investigations is described as follows:

The two studies reported here constitute an attempt to appraise the effectiveness of visual materials as learning aids in fifth-grade geography. The acquisition of information is the criterion upon which the appraisal sought by these studies is based.

While the studies were conducted at different times and touch upon different questions, they are discussed in the same report because of the relationship which the problems will later be shown to bear to each other.

The first experiment seeks to discover the comparative effectiveness of instruction in geography when lantern slides, still films, and stereographs are used as the only visual aids and when they are used in conjunction with motion-picture films.

Obviously, the purpose of this study is to find if and to what degree instruction in geography is rendered more effective when the more common visual aids are supplemented by motion pictures. Such a problem is one of practical significance when one considers the investment required to supply films and motion-picture apparatus, the time and effort needed to train teachers in the use of such equipment, and the care necessary for the proper maintenance of films and projectors.

The second is an attempt to determine the comparative effectiveness of in-

struction in geography when lantern slides, still films, stereographs, and motion-picture films are utilized and when no visual aids are used. The question involved is the contribution of all the visual aids mentioned when used as a supplement to the usual text materials available in the classroom. It is of definite value to have reliable information on the extent to which the aids mentioned increase the effectiveness of learning. Of course, a multitude of other problems suggest themselves as pertinent and worthy of study, but the two mentioned were considered of immediate interest and were, therefore, chosen for experimentation. Before presenting a detailed account of the present investigations, reference will be made to some of the work which has been done by other experimenters on the use of visual aids in teaching.

The following statement summarizes the general conclusions drawn from the two investigations.

The conclusions which may be drawn from the results here summarized are subject to all the limitations inhering in the investigations which have been described. From the results of these studies, it would appear that, in so far as the acquisition of information is concerned, the addition of motion-picture films to lantern slides, still films, and stereographs increases learning by about 14.5 per cent with the chances of a true difference in favor of the group using motion pictures being 98 in 100. In the reading of geographical material, in problem-solving, and in the reading of maps and graphs, the differences resulting from the presence and absence of motion-picture films when the other items of visual equipment mentioned remain constant, are such as to indicate no definite advantage to either plan. However, when all the visual aids enumerated are used, the consequent increase of information is practically 23 per cent greater than the amount of information accruing in the absence of such aids. This difference is statistically reliable and obtains when gains are measured by an information test following the instructional period immediately. A similar test, administered five weeks later, shows an additional gain of 11 per cent for the visual-aids group but a loss of 11 per cent for the other groups. When comparisons of gains are made as between the initial test and the test of delayed recall, the visual-aids group exceeds the other by a statistically reliable difference of about 54 per cent.

AN EXPERIMENT WITH A ONE-FIGURE DIVISOR IN SHORT AND LONG DIVISION. I

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It has been the common practice in the elementary school to teach division by a one-figure divisor in the short form. After the pupils have achieved a certain degree of mastery with a one-figure divisor, division has been taught in the long form with a two-figure divisor. Until recently little scientific experimentation had been carried out which enables one to give an appraisal of this procedure. It is probable that the use of a uniform procedure with all divisors would produce better results than the teaching of two different forms.

The study reported in this article was made to determine the relative speed and accuracy of pupils when using the long form and the short form with a one-figure divisor. No attempt was made to determine which form is easier for pupils to learn. All the subjects used in this investigation had been taught to use short division when dividing by a one-figure divisor. The problem, then, was to determine whether the group of pupils who had learned to divide by the short form could make better scores in speed and accuracy when the long form was used with a one-figure divisor.

Although the common practice has been to teach the short form for division by a one-figure divisor, within the past few years there has developed a mass of expert opinion and experimental evidence to challenge the validity of this practice. Buckingham found that five of the six members of the arithmetic committee for the Twenty-ninth Yearbook were in favor of teaching the long form for division by a one-figure divisor.[1] The sixth member was not opposed to the long form, but he considered the experimental evidence insufficient to justify a change from the short form.

[1] B. R. Buckingham, "The Training of Teachers of Arithmetic," *Report of the Society's Committee on Arithmetic*, p. 376. Twenty-ninth Yearbook of the National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Co., 1930.

Morton questions the practice of teaching short division before teaching the long form. He illustrates how the pupil must deal with unseen numbers when he solves an example by short division.

> If a pupil is learning to solve the example $6\overline{)876}^{146}$ by short division, he must think of a 2 left over after the first division, must visualize the 2 which he cannot see prefixed to the 7 which he can see, must think, "How many 6's in 27?" must subtract an invisible 24 from a partially visible 27, etc. This is difficult, very difficult for third-grade children. But if the solution is written out in the customary long-division form, there is less left to mental imagery, the steps in the process are clearly portrayed, and the pupil will master the elements of a difficult process without the unfortunate condition of initial discouragement.[1]

Myers assumes that tradition is the chief factor which dictates the sequence for the form of division: "The only reason I can see for beginning long division second, and for making it so hard by using a two-digit number as a divisor, is that it has always been done that way before."[2]

Ballard has given some timely suggestions about the adoption of a uniform procedure or rule for any given process. He calls a uniform procedure the "King's Highway." The criteria for this uniform procedure are as follows:

> It should be simple, it should be easy, it should be safe, and it should be universally applicable. When I say it should be simple and easy, I am speaking relatively; what I mean is that it should have no *unnecessary* complications and no *unnecessary* difficulties. The method having been carefully and definitely chosen, it should be regarded as the King's Highway which all should learn to tread before they venture upon bypaths and short cuts.[3]

Ballard further states: "It is wrong to regard long and short division as two distinct rules. They are not. There is only one rule; and that is long division."[4]

Johnson[5] recommends that the long-division form for a one-figure

[1] Robert Lee Morton, *Teaching Arithmetic in the Primary Grades*, p. 168. Newark, New Jersey: Silver, Burdett & Co., 1927.

[2] Garry Cleveland Myers, "Beginning Long Division," *Grade Teacher*, XLVII (March, 1930), 542.

[3] Philip B. Ballard, *Teaching the Essentials of Arithmetic*, p. 45. London: University of London Press, 1928.

[4] *Ibid.*, p. 170.

[5] T. J. Johnson, "Short Division or Long Division First?" *Chicago Schools Journal*, XII (October, 1929), 55–56.

divisor should be taught first because it will facilitate the work with a two-figure divisor. He states that, if the short-division form is taught, it should be introduced as a short-cut procedure after the longer form is known.

Although the views set forth by the men quoted are subjective and are not supplemented by experimental evidence, the opinions of recognized authorities cannot be ignored in forming an appraisal of a given procedure.

Two experimental studies which treat of the use of a one-figure divisor have been reported. John made a study with two groups of fourteen pupils each from a fifth-grade class at the University Elementary School, University of Chicago. Group 1 was taught to divide by a one-figure divisor by the short form, and Group 2 was taught to use the long form for the same type of divisor. After instruction in division by one-figure divisors had been given for one week, both groups were taught to divide by two-figure divisors. The results obtained from using the two notations for one-figure divisors are summarized by John as follows:

1. Before the pupils were taught to divide by two-digit numbers, Group 1, the group dividing by one-digit numbers by means of the short-division form, showed greater speed, and Group 2, the group using the long-division form, showed greater accuracy.

2. After division involving divisors of two or more digits had been taught, the pupils who were taught to use the long-division form in dividing by one-digit numbers were able to solve examples with either kind of divisor more rapidly and more accurately than the pupils who were taught to use the short-division form in dividing by one-digit numbers.

3. The pupils who were taught both forms tended to use the long-division form in all examples regardless of the fact that they had been taught to solve examples with one-digit divisors by means of the short-division form.[1]

John concludes that division by any divisor should be taught at the beginning in the long-division form and that, when this method has been learned, the short-division method may be taught as a short cut.

Olander and Sharp tested a group of 1,265 pupils in Grades IV–XII, inclusive, to determine which form is superior for a one-figure

[1] Leonore John, "The Effect of Using the Long-Division Form in Teaching Division by One-Digit Numbers," *Elementary School Journal*, XXX (May, 1930), 682–83.

divisor. They gave two different tests. The first test contained five difficult examples having one-figure divisors and two examples having two-figure divisors. The pupils were told to solve the examples, but no instructions were given specifying whether long or short division should be used. The second test contained ten examples, five of which were to be solved by the short-division form and the remaining five by the long-division form. The results of the tests are summarized as follows:

> 1. Three out of four pupils from Grades IV to XII, inclusive, chose to work difficult examples in division with single-digit divisors by long division. . . . .
>
> 2. Little difference in choice of method could be attributed to the grade in school to which a child belonged. High-school pupils varied little from those in the elementary school. . . . .
>
> 3. A slightly stronger tendency toward short division on the part of good students both in the elementary- and high-school grades was observed.
>
> 4. Pupils used the long-division method with greater accuracy.[1]

As a result of these experiments, Olander and Sharp arrived at about the same conclusion as that given by John. They state:

> Teachers should not only teach long division first but teach it as the regular method that will be used by the majority of the pupils. Short division can then be taught as a short cut to be used particularly with comparatively easy examples. Especially the better pupils may be advised to employ the short method.[2]

The views expressed by the authorities cited and the results of the two experimental studies indicate that the long-division form is superior to the short-division form for a one-figure divisor. If the latter form is taught, it should be taught as a short cut, preferably to the more gifted pupils and for use with easy examples. The experiment by Olander and Sharp gave no consideration to the factor of time. In the experiment conducted by John the time was recorded and found to favor the long-division form. However, the experimental groups in John's study were too small to produce particularly reliable results. The writer, therefore, constructed a test in which easy and difficult division examples were included and in which both accuracy and speed were to be measured for each pupil taking the test.

[1] Herbert T. Olander and E. Preston Sharp, "Long Division versus Short Division, *Journal of Educational Research*, XXVI (September, 1932), 11.

[2] *Loc. cit.*

CONSTRUCTION OF THE TEST USED IN THIS STUDY

Olander and Sharp state that one part of their test consisted of five easy and five difficult examples in division, but they give no explanation of what constitutes an easy or a difficult division example with a one-figure divisor. There are no experimental studies which rank the division facts in the order of difficulty. Hence, the determination of an easy or a difficult division example with a one-figure divisor is subjective. The writer's opinion is that the thing which makes short division difficult is the higher-decade subtraction for finding the carry-number. Higher-decade subtraction is used when a two-figure number which is a multiplication product is subtracted in one mental operation from another two-figure number and the remainder is a one-figure number. Thus, $57-54$ represents a higher-decade subtraction fact in division, but $57-53$ does not because 53 is not a multiplication product. It is readily seen that the example may or may not involve bridging the decade. The example $52-45$ represents one which bridges the decade, but $49-45$ does not span the decade. In this study a difficult division example is one in which all the higher-decade subtractions used to find the carry-numbers bridge the decade. An easy division example is one in which the subtractions do not bridge the decade and in which the remainders do not exceed three. A priori reasoning would lead to the conclusion that, when two two-figure numbers in the same decade are subtracted and the remainder is 1, 2, or 3, the example should be relatively easy.

The test which was constructed consisted of two parts. Part I included a sampling of examples which have been defined as easy examples, and Part II contained a sampling of the difficult examples with one-figure divisors. In each part there were fifteen examples, five of which contained four figures in the quotient and the remaining ten, three figures. A pupil in Grade IV is supposed to be able to divide numbers that contain at least four figures in the quotient.[1] As no duplications of any division fact appeared in the test, there was a sampling of 100 different facts out of a possible 450 division

[1] *A Teacher's Guide Book and Course of Study in Arithmetic*, pp. 124–27. Trenton, New Jersey: State Department of Public Instruction, 1930.

facts with a one-figure divisor. The latter number includes all zero types and also a divisor of 1.

Various types of difficulties were sampled in the test. In Part II all the examples contained remainders because each subtraction was planned to bridge the decade. In Part I some of the examples did and others did not have remainders. Zero types were also represented in this part of the test. Zero was found in the following positions: (1) final in both dividend and quotient, (2) final in quotient only, (3) not final in dividend only, and (4) not final in quotient only. In the second part of the test another zero type, not included in Part I, was included, namely, the type in which zero was final in the dividend only.

The test was constructed in two forms, known as Form A and Form B. The examples were identical in both forms, but in Form A the short-division form was to be used and in Form B, the long-division form. The following examples were used in these two forms.

PART I

a. $3\overline{)2844}$	*b.* $5\overline{)7826}$	*c.* $2\overline{)1714}$	*d.* $7\overline{)45663}$
e. $4\overline{)1546}$	*f.* $8\overline{)5785}$	*g.* $9\overline{)7589}$	*h.* $4\overline{)27322}$
i. $6\overline{)2761}$	*j.* $9\overline{)8389}$	*k.* $7\overline{)6595}$	*l.* $5\overline{)3704}$
m. $6\overline{)7838}$	*n.* $3\overline{)2297}$	*o.* $2\overline{)5900}$	

PART II

a. $7\overline{)4031}$	*b.* $9\overline{)21211}$	*c.* $7\overline{)5100}$	*d.* $8\overline{)2215}$
e. $9\overline{)31121}$	*f.* $6\overline{)2031}$	*g.* $9\overline{)2230}$	*h.* $8\overline{)50300}$
i. $6\overline{)4101}$	*j.* $9\overline{)4220}$	*k.* $8\overline{)21431}$	*l.* $7\overline{)6124}$
m. $8\overline{)5102}$	*n.* $7\overline{)31352}$	*o.* $9\overline{)2303}$	

The examples were lettered instead of numbered in order that the pupils would not confuse the number of an example with the divisor. The quotient was written above the dividend in the short form because the pupils used in this study had been taught that notation. If the classes tested had been taught to write the quotient below the dividend in short division, that form would have been used in this test.

ADMINISTRATION OF THE TEST

Forms A and B of the test were given in Grades V–XII, inclusive, and to students in each year of a three-year normal-school course. These latter three years will be designated in this article as Grades XIII, XIV, and XV. No distinction was made between the first and the second half-year sections of a grade; that is, scores for the pupils of Grade VIII may have been made by pupils who had been in the grade since September, by those who had been in the grade since the first of February, or by a combination of both groups. Since most of the promotions in the schools tested were made in September, the largest sampling is from that group. The test was given during the month of March, 1933. Grade V was the lowest grade in which the test was given because of the difficulty in using a one-figure divisor in the long-division form encountered by pupils in a grade below the fifth. None of the groups tested had been taught to use the long form for a one-figure divisor.

Pupils in Grades V–XII were taken from the public schools of two school systems near Jersey City, and for the upper three grades students were selected from the normal schools at Jersey City and Newark. An attempt was made to have approximately one hundred students in each grade take each form of the test. In some grades it was feasible to test more cases than the assigned number, and in others there was a shortage of the arbitrarily fixed number.

All the tests were administered by the regular classroom teachers or teachers of mathematics in the different schools under the supervision of the writer. A set of uniform instructions, which was to be read to the class when the test was administered, was given to each teacher. Beyond the level of Grade VII the whole test was completed in one class period. In Grades V–VII, inclusive, Part I was completed at one class period, and on the following day Part II was administered. Two test periods were used in the latter grades in order that the regular schedule of classes need not be interrupted. To have completed the whole test at one working period in these grades would have required an extension of a regular class period.

When the tests were distributed, alternate pupils in each group received Form A, and the remainder received Form B. The former group was to use the short-division form and the latter, the long-

division form. The operation of the laws of chance was supposed to form equivalent groups. According to McCall, this method for forming equivalent groups is satisfactory:

> Just as representativeness can be secured by the method of chance, when the subjects involved are sufficiently numerous, so equivalence may be secured by chance, provided the number of subjects to be used is sufficiently numerous. . . . . Any device which will make the selection truly random is satisfactory.[1]

The use of every alternate pupil made the method of selection truly random; hence, it may be assumed that equivalent groups were formed. Since the educative factors affecting achievement were held constant in each group, any difference in the achievements of the two groups would be due to the experimental factor, namely, the type of notation used.

Before beginning the test, pupils using Form A worked a sample example by using the short-division form; those using Form B solved the same example by the long-division form. A sample was also shown on the first page of the test. The teacher instructed the pupils to work as rapidly as possible but to be sure that their work was accurate. He further instructed them to record at the bottom of Part I of the test the last number written on the board and then to put their pencils down before beginning Part II. When all had finished Part I, a similar procedure was followed for Part II. After work was begun on each part of the test, the teacher wrote consecutive numbers on the board at fifteen-second intervals until the slowest pupil in the group had finished the part of the test on which he was working. Thus, if 14 was written at the bottom of Part I of a test, the pupil had required 3.5 minutes to complete that section of the test. In the following pages all scores for time are given in fifteen-second intervals instead of minutes. The use of these interval numbers eliminated the necessity of dealing with fractional parts of a minute.

The accuracy of the work was measured by the lack of errors in the test. An error consisted in an incorrect figure in the quotient or in the remainder. The pupil was instructed to write the remainder as a remainder and not as a fraction. Thus, the result for the ex-

[1] William A. McCall, *How To Experiment in Education*, pp. 41–42. New York: Macmillan Co., 1923.

ample $3\overline{)521}$ should be written as $173+2$ and not as $173\frac{2}{3}$. However, if the fraction form was used and the correct figures were given, the example was considered correct. There were 100 quotient figures and 27 remainders, or a total of 127 possible errors. A pupil's test score was not penalized because of the use of crutches or devices provided the correct figures appeared in the quotient and in the remainder. A large percentage of the pupils working Form A used the crutch of writing down the carry-number in the dividend.

TABLE I

MEAN NUMBER OF ERRORS AND MEAN TIME IN FIFTEEN-SECOND INTERVALS MADE BY SUBJECTS IN GRADES V–XV ON FORMS A AND B OF TEST IN DIVISION

GRADE	FORM A (SHORT-DIVISION FORM)			FORM B (LONG-DIVISION FORM)		
	Number of Cases	Mean Number of Errors	Mean Time in Fifteen-Second Intervals	Number of Cases	Mean Number of Errors	Mean Time in Fifteen-Second Intervals
V.....	111	21.60±1.050	89.86±2.660	100	17.52±0.940	115.70±3.181
VI.....	109	17.91±0.870	70.32±1.862	102	14.27±0.874	85.10±2.000
VII.....	144	15.79±0.765	62.12±1.220	136	9.21±0.538	72.32±1.320
VIII.....	104	11.37±0.670	54.54±1.250	96	7.06±0.508	64.17±1.215
IX.....	140	11.10±0.487	44.78±0.757	135	6.48±0.408	53.29±1.676
X.....	101	10.27±0.629	42.46±0.763	102	6.16±0.475	51.69±0.801
XI.....	107	7.50±0.405	36.44±0.625	107	3.63±0.235	40.31±0.689
XII.....	116	11.03±0.675	34.09±0.543	106	5.26±0.352	39.64±0.614
XIII.....	103	9.52±0.485	39.44±0.613	110	5.42±0.364	41.17±0.585
XIV.....	88	8.63±0.429	37.60±0.675	87	3.46±0.226	40.81±0.690
XV.....	82	9.48±0.467	36.73±0.700	79	3.45±0.259	42.28±0.647

RESULTS OF THE TEST

The mean number of errors and the mean time for each grade on both forms are given in Table I. This table shows that more errors were made on Form A but that less time was consumed in working the examples than on Form B.

It is advisable to determine whether the differences in the mean number of errors and in the mean time on the two forms for each grade are significant. The usual technique applied is to find the

probable error of the difference of the means of the two tests. This probable error is found by using the following formula.[1]

$$P.E._{M_1-M_2} = \sqrt{(P.E._{M_1})^2 + (P.E._{M_2})^2}$$

The probable errors of the differences of the means found by the use of this formula are given in Table II. The difference between the two

TABLE II

COMPARISON OF DIFFERENCES IN MEAN NUMBER OF ERRORS AND MEAN SCORES ON TIME ON FORMS A AND B OF TEST IN DIVISION

Grade	Number of Errors			Scores on Time		
	Difference in Means*	Probable Error of Difference	Ratio of Difference to Its Probable Error	Difference in Means*	Probable Error of Difference	Ratio of Difference to Its Probable Error
V	+4.08	1.408	2.90†	−25.84	4.147	6.23
VI	+3.64	1.233	2.95†	−14.78	2.733	5.41
VII	+6.58	0.935	7.04	−10.20	1.800	5.67
VIII	+4.31	0.841	5.12	− 9.63	1.743	5.52
IX	+4.62	0.635	7.28	− 8.51	1.015	8.38
X	+4.11	0.788	5.22	− 9.23	1.106	8.35
XI	+3.87	0.468	8.27	− 3.87	0.930	4.16
XII	+5.77	0.761	7.58	− 5.55	0.819	6.78
XIII	+4.10	0.606	6.77	− 1.73	0.847	2.04†
XIV	+5.17	0.485	10.66	− 3.21	0.965	3.33†
XV	+6.03	0.534	11.29	− 5.55	0.953	5.82

* The differences preceded by a plus sign favor the long-division form; those preceded by a minus sign, the short-division form.

† Not a significant difference.

means was then compared with its probable error. When this difference is at least four times its probable error, there is more than a chance difference in the difficulty of the two forms. Table II shows the ratio of the difference of the means to its probable error in each grade. It is readily seen that there was a significant difference in accuracy in favor of the long-division form in every grade except Grades V and VI. As a general rule, the farther away from the grade in which short division was taught, the more pronounced was the difference in favor of the long form.

[1] Karl J. Holzinger, *Statistical Methods for Students in Education*, p. 235. Boston: Ginn & Co., 1928.

From the standpoint of time, in all the grades except two there was a significant difference in favor of the short-division form. However, there was a tendency for the difference in time to be less significant the farther removed were the subjects from the grade in which short division was taught. These data point conclusively to long division as the desirable form for accuracy and short division for speed. They also show that short division is in its most effective period from the standpoint of both speed and accuracy at or near the grade level at which it is taught. In other words, the bonds formed in short division are temporary, and they need much practice to keep them functioning properly.

TABLE III

NUMBER OF PAPERS WITHOUT ERRORS ON FORM A (SHORT-DIVISION FORM) AND FORM B (LONG-DIVISION FORM) IN GRADES V–XV

GRADE	NUMBER OF PAPERS WITHOUT ERRORS		GRADE	NUMBER OF PAPERS WITHOUT ERRORS	
	Form A	Form B		Form A	Form B
V	0	4	XI	13	37
VI	1	11	XII	12	31
VII	5	20	XIII	5	28
VIII	5	20	XIV	6	28
IX	5	30	XV	4	29
X	11	25	Total	67	263

More evidence to show that the long-division form produces superior accuracy consists in the number of papers in each grade showing no errors. Table III shows the number of papers without errors on Forms A and B in each grade. There were almost four times as many papers without errors among the group which used the long-division form as among the group that used the short form. It is rather noteworthy that out of 220 papers in Grades V and VI only one paper without errors was submitted by the short-division group. It was in these two grades that the difference between the mean number of errors on the two forms was not significant.

[*To be concluded*]

THE NATURE AND DEVELOPMENT OF CONCEPTS OF TIME AMONG YOUNG CHILDREN

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Among the learnings which a child must master in his early years are the ability to understand time and the ability to use the vocabulary of time intelligently as it is used in the society into which he is born and to which he must adjust himself. During his early years the adult members of his family make most of the time adjustments for him, but through the routine of his day and the urgency of his bodily needs, he begins to recognize time as an important item of his experience. His ideas of punctuality, of measurement and passage of time are, of course, of the haziest and will remain so until he becomes responsible for his own adjustment as an individual to a time-regulated society.

The type of learning involved in the gaining of the idea of time is that of conceptual learning. A "concept" may be defined in varying terms by different psychologists, for example, a "symbol" standing for a large number of objects or relationships of objects, which may serve to elicit as its meaning the features possessed in common by the group of objects or the relationships;[1] a " 'cue' to adjustment";[2] detached meanings which "give direction to conduct" and are "readily available for use in a variety of situations";[3] "meaning sufficiently individualized to be directly grasped and readily used, and thus fixed by a word";[4] or a "symbol reaction."[5] For the purposes of this paper, the writer will define a "concept" simply as a meaning.

[1] Margaret Wooster Curti, *Child Psychology*, p. 244. New York: Longmans, Green & Co., 1930.

[2] William Chandler Bagley, *Educational Values*, p. 35. New York: Macmillan Co., 1911.

[3] Boyd H. Bode, *Fundamentals of Education*, pp. 151–52. New York: Macmillan Co., 1926.

[4] John Dewey, *How We Think*, p. 125. Boston: D. C. Heath & Co., 1910.

[5] Floyd Henry Allport, *Social Psychology*, p. 416. Boston: Houghton Mifflin Co., 1924.

Concepts are developed through experience in connection with perceptive activities. By means of discriminative reactions, in proportion to the narrowness or the breadth of one's environment, one constantly builds up new concepts through the processes of abstraction and generalization. Concepts become more refined by means of continued processes of analysis and synthesis. The concepts of young children develop slowly because of their lack of extended experience whereby abstractions and generalizations may result. Young children tend to think in terms of particular events and experiences related to the growing concept. Time concepts are built up in just this manner but are particularly slow of development because they are extremely abstract.

The history of the telling of time as developed by man is a most interesting story. Primitive man was regulated merely by the occurrences of night, of day, and of the seasons and by the periodic demands of his own physical being, such as the need of food. Later, man recognized the divisions of day by the position of the sun in the sky and the regular occurrences in response to his personal needs and those of his social group. With the growth of co-operative living the idea of punctuality and its necessity to a well-regulated society came to be realized, and invention began to satisfy the felt need with the resulting long series of developments in the making of objective time regulators. Man brought in his contribution of hours, minutes, and seconds, whereas nature had given him only suns, moons, stars, and seasons as indicators of the passage of time. The development of precision through time-telling devices aided society to such an extent that we moderns look on the idea of punctuality as one of the vital institutions for regulating behavior in a co-operative society. Recognizing its value, we insist that children learn to tell time as early as possible in their social careers.

The first indications of a sense of time in young children, as recorded by Decroly and Degand,[1] have to do with simultaneities; that is, the sight of a person coming to the child at a certain time indicates to the child that a bath is to be given or, at another time, that the afternoon nap is to be taken. The immediate past is next

[1] Mary Sturt, *The Psychology of Time*, p. 44. New York: Harcourt, Brace & Co., Inc., 1925.

distinguished and understood vaguely according to the development of memory, this understanding being first shown as an "after-shine" in memory by such a word as "gone" when a meal has been finished or a person has left the room. With further development of memory the child increases his power to think and speak in terms of a few days or weeks past, but all these times are merely periods in a vague "yesterday," a term which is applied to all time in the past. Anticipation, or a beginning of an idea of time not yet come, is next shown by his realization that some event in the regular routine of his day is soon to be performed and in his patient acceptance of such terms as "by and by," "after while," "not yet," and "in a minute." These terms he uses but does not clearly understand.

As soon as a child begins to take an active interest in the routine of activities in his day, according to the schedule set for him, he begins to get an idea of measurement of time. This idea comes through a realization that a number of events may come into a period between two major events of the day, such as all the things he will do before another meal-time arrives. He may say, "I'll go out to play, and sleep, and play again, and then we'll have supper."

With the broadening of experience with adults as conversational partners, the child soon begins to add to his vocabulary the whole battery of expressions related to time which adults use, although his experiences will not at first be broad enough to allow for the abstractions and generalizations which are necessary for complete and correct concepts of the terms. That stage in development will come with added and varied experiences during the elementary-school years, bringing about increased power for discriminative reaction on his part.

When the child enters into the social group of the school, new pressure is applied by which his concepts of time are refined. First of all, he finds that there are two clearly defined portions of a school day and that they are called by different names, namely, "morning session" and "afternoon session." At each, he is expected to arrive "on time." He also learns that within each are smaller periods, the length of which are definitely and accurately controlled, and that, to be a member of the school group, he must conform to these regulated periods of activity. He soon learns to judge, in an indefinite

way, how long each of these periods is and how to judge when one period has been completed by the activities with which it is filled. If he is bored with happenings and activities drag, he finds that it seems a long time until the period is over. If he is having a very good time and activities are carried out in rapid succession, he finds that time goes quickly. Nevertheless, he learns to conform to time regulations in spite of his feelings, and thus the refinement of his concepts of time goes on within the new school environment.

In an investigation recently carried out the writer determined the nature and the development of concepts of time among young children, from the kindergarten through the third grade, using fifty commonly used terms selected from eight vocabulary studies. The responses to these terms, gained in individual interviews with 160 children of those grades, were recorded as showing (1) comprehension of general idea and specific facts (complete comprehension); (2) comprehension of general idea but knowledge of no specific facts (partial comprehension); (3) comprehension of general idea but incomplete knowledge of specific facts (partial comprehension); (4) comprehension of partial facts but no comprehension of general idea (partial comprehension); (5) confused comprehension, shown by the giving of both right and wrong answers; (6) complete misconception in general idea and specific facts; or (7) complete lack of comprehension, shown by no responses and "don't know" answers.

The percentages of the various types of responses for the fifty terms investigated are given in Table I. The data indicate a continuous and steady increase in growth, from grade to grade, of complete conception and a decrease of incomplete, confused, and wrong concepts, and of omissions. The data gathered in the investigation indicate that the development of concepts of time bears a fairly close relation to grade development, there being a correlation of $+.66 \pm .04$ between the two factors.

Growth in particular types of learning are closely related to a grasp of the concepts of time from grade to grade. As language is refined, its usage effects the development of the concepts; for example, "before" and "after" are terms which confuse the child's concepts of time if wrongly used. At first, the child is not sure exactly how these terms should be used in respect to time-telling. He has

already used "before" in an objective sense to express "in front of"; therefore, when he first uses the term in connection with time, he tends to use it to express future time instead of time in the past. This difficulty makes for confusion in his expression of future time. The same confusion is likely to occur in his use of the term "after" in time-telling. He tends to use it first in expressing past instead of

TABLE I

PERCENTAGE DISTRIBUTION OF RESPONSES OF 160 CHILDREN IN FOUR GRADES ACCORDING TO THE PUPILS' COMPREHENSION OF 50 TIME CONCEPTS

DEGREE OF COMPREHENSION	PERCENTAGE OF RESPONSES IN GRADE				
	Kindergarten	I	II	III	Average
1. Complete comprehension in general idea and specific facts	22	29	43	60	38
2. Partial comprehension, general idea, no specific facts	8	8	4	2	6
3. Partial comprehension, general idea, incomplete facts	12	15	16	14	14
4. Partial comprehension, partial facts, no general idea	2	3	2	1	2
5. Confused comprehension shown by both right and wrong answers	23	20	22	17	20
6. Complete misconception in general idea and specific facts	13	11	5	2	8
7. No responses and "don't know" answers	20	14	8	4	12
Total	100	100	100	100	100

future time because the term as he has been accustomed to use it means "behind"; since past time is behind us, he tends to apply the word in the sense he knows. Other words often cause confusion until in the process of language development, the finer shades of meaning are attained and understood, and the child finds it easy to express himself with respect to time.

Some concepts of time are dependent on the growth of number meanings and relationships in the child's thinking. The child cannot possibly understand completely the meaning of "month" until he has the correct concept of thirty and thirty-one and their relation to

seven (the number of days in the week), which will enable him to understand that four weeks with two or three days remaining make the thirty- or thirty-one-day month. He will not comprehend the term "year" until the number twelve is fully understood as the number of months in the year, as well as the number 365 as the number of days. That is, the numerical relations of day, week, month, season, and year must be understood before the child can arrive at a complete concept of those terms as measurements of time. Increased language ability and an understanding of primary number meanings and relationships, which come to a fairly well-developed state at the

TABLE II

PERCENTAGES OF RESPONSES INDICATING COMPLETE COMPREHENSION OF FIFTY TIME CONCEPTS BY PUPILS AT THREE INTELLIGENCE LEVELS

GRADE	INTELLIGENCE LEVEL		
	High	Middle	Low
Kindergarten	30.2	24.0	10.8
I	49.6	24.9	14.8
II	54.8	45.5	26.2
III	70.4	62.3	43.2
Average	51.3	39.2	23.8

end of the primary grades, make it possible for children then to use expressions of time with meaning and to adapt the use of the calendar to their needs as an instrument of value in the reckoning of time and time relationships.

Other factors which are of importance are mental development and chronological age. The differences in the grasp of concepts of time by children of different levels of intelligence within grades was studied by dividing the children into high, middle, and low groups according to the intelligence quotient. The percentage of correct responses at each level is shown in Table II. It will be noted that there is a difference of only 13 between the percentage of complete responses made by pupils at the low level of intelligence in Grade III and the corresponding percentage at the high level in the kinder-

garten. The percentage of complete responses given by the low group in Grade III is only 6 less than the percentage of complete responses given by pupils at the high level in Grade I. The correlation between grasp of concepts of time and mental age was found to be $+.70 \pm .03$; between grasp of concepts of time and chronological age, $+.58 \pm .05$. These correlations indicate that concepts of time develop in closer agreement with inner maturation, as indicated by mental maturity, than with training and experience, as indicated by chronological age and grade placement.

Until the child has a grasp of the concepts of time, he cannot possibly develop a sense of historical sequence, upon which a study of history depends. He can make no clear-cut distinction between the time of remote happenings and the time of occurrences within the immediate past, nor can he comprehend the significance of a succession of periods in history until an understanding of time is attained. Even then, the larger measures of time cannot be entirely meaningful to him unless they are filled with events which the child comprehends as being carried out in a number of periods of time, such as are equal to those within his experience. The two laws which govern his feelings for historical sequence in the attitude of retrospect are exactly the reverse of those which govern his attitude toward immediately experienced time. In retrospect, or historical imagination, unfilled time seems short and filled time seems long because in retrospect we realize the length of time only through our memory of events filling that time. Few events in the memory-train leave time unfilled and make it seem short, while many events in the memory-train fill time and make it seem long.

Oakden and Sturt[1] have concluded that concepts of time are mature at the age of thirteen or fourteen and that from then on individuals should find no difficulty in adjusting themselves to a time-regulated society or in achieving correct historical imagination. It is the opinion of the writer, however, that further study of history should continue to refine those concepts by filling remembered periods with interesting historical events. This opinion is gained from observation of students of history and through in-

[1] E. C. Oakden and Mary Sturt, "The Development of the Knowledge of Time in Children," *British Journal of Psychology*, XII (April, 1922), 334.

trospection concerning changes in the writer's own historical imagination.

As teachers, we must help children to feel the importance of time-telling as a valuable asset in modern social life, and we must also carefully take into account how we may help them to achieve matured concepts of time through language development and the development of number concept. In our use of the terms relating to time we must ourselves be accurate and precise in order that confusion will not result in children's minds. The term "minute," for example, might be more clearly understood by the small child if we did not often say, "Wait a minute," and then require him to wait a half-hour. We shall also need to help the child to use accurately nature's simpler means of time-reckoning before we expect him to struggle with artificial minutes, hours, and seconds as they are arranged on the face of the clock (where the numeral I may mean one o'clock or five minutes past the hour, according to the hand which points to it). We must remember that the bright child will make the required abstractions and generalizations much earlier in his development than the mediocre or the dull child and that, with children of the latter two types, we shall have need of great patience and care lest we confuse them in their effort to master this abstract phase of their learning.

THE LEARNING OF FUNDAMENTALS IN AN ARITHMETIC ACTIVITY PROGRAM

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THE PROBLEM

The writers set out to discover the extent to which the fundamentals are learned in an arithmetic activity program. In this particular study we were not experimenting with an integrated activity program. Such a procedure is more complex, involves more variables, and should logically come after some experience with a program of activities limited to one subject. In fact, the experiment reported in this article made several concessions to the conventional content and order of learning arithmetic.

The study was limited to the multiplication and the division of fractions and to denominate numbers which are commonly learned in the second term of Grade V. The activities were selected deliberately because they were rich in the applications of the fundamental processes in the multiplication and division of fractions and in denominate numbers. Nevertheless, the activities were genuinely real on the child's level of maturity. They were based on meaningful situations in the child's experience in school and out of school. The children participated in selecting and planning the units of work. The actual life-situations were, as far as possible, reproduced in the classroom. The materials utilized were those which occur in life. The activities included weighing and measuring materials, cooking meals, sewing garments, serving meals, purchasing goods, eating meals, reading recipes, entertaining children and adults, decorating classrooms, making baskets, assembling and arranging furniture and other equipment, cutting paper, consulting parents, obtaining estimates, comparing prices, organizing into committees, calculating costs, calculating quantities of materials, preparing food baskets,

estimating the needs of families, handling foods, and so on. There was maximum participation on the part of the pupils. The pupils communicated and associated freely as the need arose. They had abundant opportunity to choose, to judge, and to evaluate. Every unit came to a logical and natural close.

The time devoted to arithmetic was the usual daily period lasting between fifty and sixty minutes. Much of the time ordinarily devoted to drill and problem-solving was devoted to construction, manipulation, and other activities. Actually, therefore, much less than the customary allotment of time was used in computations.

THE CLASS AND ITS RESOURCES

The experimental class was an ordinary class in a typical metropolitan school in Cleveland. It should, however, be pointed out that the school is designated as the arithmetic curriculum center, in which new units of work are developed for eventual distribution throughout the city or for inclusion in the next city-wide course of study. The teachers in the school are selected because of their special ability in teaching arithmetic. According to records of the general ability of the pupils based on the National Intelligence Tests, Scale A, Form 1, the intelligence quotient of the pupils ranged from 92 to 135, the average being 113. Unlike other experimental, laboratory, or private schools, the class was a typical crowded group of thirty-seven pupils. The classroom had practically no permanent learning equipment or supplies other than movable desks. The materials and equipment used in the several units were improvised and assembled when they became necessary, the resources of the school and the homes of the children and the neighborhood stores being drawn on.

THE FUNCTIONAL ARITHMETIC COURSE

The units which comprised the course included the following: (1) a candy sale, (2) understanding the advantage of an inclined plane (clarifying the science of the grade), (3) a mothers' party, (4) baskets for two needy families, (5) preparing a luncheon for Grade I, (6) making a quilt for a children's hospital, and (7) serving a teachers' luncheon. Each of these units lasted from eight to twelve

periods. With the exception of one, all the units involved some purchasing transactions by the pupils. All except two of the units involved the selection and the preparation of food. The quilt-making unit involved some designing and sewing. Four of the units involved selling transactions.

To illustrate, we give here a brief outline of the first unit, the candy sale. To raise funds for a mothers' party, the class decided to make and sell candy. The children estimated that they would need to earn five dollars. On the basis of a fifteen-cent profit on the pound, it would be necessary to make $33\frac{1}{3}$ pounds of candy. From a study of recipes five kinds of candies were selected. After testing the recipes to find out how much candy each would produce, the pupils determined how many times each recipe would have to be increased to yield $6\frac{1}{2}$ pounds of candy. Before the materials could be purchased, the ingredients, which were given in cupfuls, teaspoonfuls, and tablespoonfuls, had to be converted into pounds and ounces. Prices were obtained from two stores, and the cost of materials was calculated. The actual making of the candy required several days. The cost a pound was determined and then the selling price. Most of the candy was sold by the half-pound. The estimated cost of materials was \$4.43; the actual cost was \$3.82 because of a decline in prices. The cost of a pound of candy was 12 cents; the selling price was 27 cents. The gross receipts amounted to \$9.87. The profits from the sale amounted to \$6.05.

New arithmetical steps did not occur in the order of progressive difficulty. In fact, the most difficult step in the multiplication of fractions came first, namely, the multiplication of a mixed number by a mixed number. The simplest step ($\frac{1}{2}$ of 4) was the twelfth in the actual order of occurrence. In five of the units the more difficult steps occurred before the simpler steps.

The pupils sensed a new step at once. Very often they were asked to suggest how to perform a new process. The pupils were never allowed to attack a new process incorrectly. Each new difficulty was taken up and explained in a few minutes. For example, in the luncheon unit in Grade I, when the children were deciding which would be the most economical loaf of bread to buy, a new step was

met for the first time: dividing a number by a larger number. The five-cent loaf yielded 16 slices; the ten-cent loaf yielded 40 slices.

$5 \div 16 = 5 \times \frac{1}{16} = \frac{5}{16}$ ¢

$10 \div 40 = 10 \times \frac{1}{40} = 1 \times \frac{1}{4} = \frac{1}{4}$ ¢

The pupils' attention was drawn to the size of the divisor. It was shown that 5 could be divided by 16 but that the answer would be a fraction. In the same unit cookies were made. The recipe called for $2\frac{1}{2}$ dozen, but the class wanted to make 7 dozen. To determine how many times to increase the recipe, the pupils found it necessary to divide 7 by $2\frac{1}{2}$. This process was a new step: dividing an integer by a mixed number: $7 \div 2\frac{1}{2} = 7 \div \frac{5}{2} = 7 \times \frac{2}{5} = \frac{14}{5} = 2\frac{4}{5}$ times. The teacher called attention to the divisor and asked what must be done with such numbers before dividing. The mixed number was changed into an improper fraction, and the usual procedure in division of fractions was then applied.

Some new steps developed so naturally and imperceptibly that the pupils were barely aware of the newness or the difficulty of the process. Frequently a step belonging to an advanced grade was met. The step was explained briefly, and the pupils were told that they would meet it again later.

In this experiment we decided to dispense completely with any form of practice or drill sheets or any other supplementary exercises. We gave no diagnostic tests nor any other tests in order that the repetition of the processes might be limited exclusively to their natural occurrence in the units of work. There were, of course, many repetitions, but none of them was deliberate or extraneous. For example, when the party for mothers was being planned, it was necessary to increase the recipes of three kinds of cookies. Since each recipe required eight ingredients, there resulted twenty-four repetitions of the multiplication of fractions.

All the work of the pupil was kept in a notebook, which was frequently checked by the teacher. No child was permitted to leave an error uncorrected. The notebooks proved to be a valuable source of information, the pupils referring to their records frequently. No textbook nor any other printed material was used in this experimental course.

The conditions under which the experimental course was conducted may be summarized as follows: (1) The units were based on

socially real situations or activities. (2) The situations were selected because they were rich in the use of fractions. (3) No attention was given to the order of the occurrence of the steps in fractions. (4) No external practice or drill was introduced. (5) No more than the usual time allotted to arithmetic was devoted to computation. (6) The experimental class was an ordinary group of 37 children having an average intelligence quotient of 113 on the National Intelligence Tests, Scale A, Form 1. (7) The teacher was one of a group especially selected for this school because she excelled in the teaching of arithmetic.

RECORDING THE DATA

The fundamental steps.—It will be recalled that the purpose of this experiment was to determine whether the arithmetical processes were learned. The fundamental arithmetical steps or processes have been isolated repeatedly. For our purpose we used the analysis made by the staff of our local curriculum center for arithmetic. The list of basic steps included eight steps in multiplication of fractions, six steps in the division of fractions, and twelve steps in denominate numbers.

The preliminary and the final tests.—This list of fundamental steps formed the basis of the preliminary and the final tests containing seventeen items of three exercises each. The two forms actually used were those designed by the Milford School, the experimental center, to test the mastery of the processes for the grade. A step was considered mastered when the pupil worked correctly two of the three exercises involving that step. The results of these tests furnished our main conclusions. In addition to this test of mastery, the pupils were given a preliminary and a final test in practical problems involving the basic steps, as a further check on our experiment.

Sequence of steps and number of repetitions of steps.—With the aid of a chart we kept a daily record of the order in which each step occurred. Thus, we knew the exact sequence in which the arithmetical steps occurred in each unit. We were interested to know whether the random sequence of steps had any effect on the children's mastery of the steps. Again, using a chart, we kept a daily record of the number of times each step was repeated. We therefore had an exact record of the amount of practice on each step as it was provided by

our selected functional units of arithmetic. These data enabled us to determine whether there was any relation between the amount of practice and mastery.

The units themselves were recorded in detail, the actual development of the learning experiences and the arithmetical computations as they arose being shown. These records served not only as complete records of the experiment for us but also as records of learning experiences which other teachers may wish to try. The units,[1] the tests, and our detailed records are available to anyone at the cost of copying.

In summary, the following data were recorded: (1) the fundamental arithmetical steps, (2) a detailed account of the development of each unit, (3) the score of each pupil on the preliminary test of processes, (4) the score of each pupil on the final test, (5) the sequence of the processes in each unit of work, and (6) the number of times each process was repeated in each unit and in the whole term.

THE DATA

Were the fundamentals learned?—It will be recalled that the primary purpose of the experiment was to discover whether denominate numbers and the fundamental processes in the multiplication and the division of fractions could be mastered in an arithmetic activity program based on situations in school and social life. With the exception of eleven pupils who had had some work in the multiplication of fractions, the preliminary test showed that the pupils possessed little ability to use the basic processes correctly. Table I gives data on the number of steps mastered, as measured by the final test. The final test showed that the average number of steps learned by the class was 14.2 out of the 17 processes included in the tests. This showing is equivalent to a mastery of 84 per cent of the processes. Seven pupils mastered all the steps; eight pupils mastered sixteen steps; five pupils mastered fifteen steps. Seventy-three per cent of the pupils mastered at least 75 per cent of the steps included in the half-grade. Only one pupil mastered less than 50 per cent of all the steps. The group did especially well in denominate numbers, only one pupil failing to make a perfect score on this part of the test.

[1] The units have recently been made available in mimeographed form and may be secured from the senior author for fifteen cents a copy.

This showing represents a mastery of 98 per cent for the whole class. The degree of the pupils' mastery of the processes in the division of fractions was greater than the degree of their mastery of the processes in the multiplication of fractions. In division of fractions they mastered 83 per cent of the processes, and in multiplication of fractions they mastered 79 per cent of the processes. The supplementary test of problems applying the processes confirmed the results of the basic test, the pupils making a composite score of 86 per cent of correct answers.

TABLE I

DISTRIBUTION OF PUPILS ACCORDING TO NUMBER OF ARITHMETICAL STEPS MASTERED IN ARITHMETIC ACTIVITY
CLASS IN GRADE V A

NUMBER OF STEPS MASTERED	PERCENTAGE OF STEPS MASTERED	PUPILS MASTERING STEPS	
		Number	Per Cent
17 (all)	100	7	18.9
16	94	8	21.7
15	88	5	13.5
14	82	4	10.8
13	76	3	8.1
12	71	5	13.5
11	65	3	8.1
9	53	1	2.7
6	35	1	2.7
Total	84	37	100.0

Did the average intelligence of the group affect the results?—It may be charged that the good showing of the experimental class resulted from the superiority of the group, the average intelligence quotient on the National Intelligence Tests being 113. To determine the accuracy of this charge, we divided the class into two halves. On the National Intelligence Tests the upper half had an average intelligence quotient of 121.4, and the lower half had an average intelligence quotient of 104.4. Table II shows that the upper half of the class mastered an average of 14.9 processes, or 87.6 per cent of the total. The lower half of the class mastered an average of 13.5 processes, or 79.4 per cent of the total. It is clear, therefore, that the average intelligence of the group was only a minor factor in accounting for the outcome of the experiment.

How much did the pupils add to their initial mastery?—The conclusions thus far have been based entirely on the result of the final test because we were primarily interested in answering the question: Are the so-called "fundamentals" learned? This procedure is precisely the same as the procedure one would follow to determine the mastery of the basic arithmetic steps in the conventional class. However, we went one step farther in our inquiry and found the percentage of mastery of the steps which the class did not know at

TABLE II

DISTRIBUTION OF PUPILS IN UPPER HALF AND LOWER HALF OF ARITHMETIC ACTIVITY CLASS ACCORDING TO NUMBER OF ARITHMETICAL STEPS MASTERED*

NUMBER OF STEPS MASTERED	NUMBER OF PUPILS MASTERING STEPS	
	Upper Half	Lower Half
17 (all)	4	3
16	6	2
15	2	3
14	1	3
13	2	1
12	2	3
11	1	2
9	0	1
6	0	1
Average number of steps mastered	14.9	13.5

* On the National Intelligence Tests the average intelligence quotient of the upper half of the class was 121.4; that of the lower half, 104.4.

the beginning of the half-grade, as revealed by the preliminary test. In other words, we wished here to eliminate all steps which according to the preliminary test the pupils already knew. After the steps which the pupils already knew had been eliminated, the data showed that the experimental class learned 79.5 per cent of the basic steps in the half-grade.

Were the steps learned in sequence?—It is obvious to anyone who has read thus far that the arithmetical steps were not learned in the order of progressive difficulty, as they are learned in the conventional arithmetic course. For years it has been taken for granted that most economical learning occurs when a system of habits is built up in

TABLE III

ORDER IN WHICH STEPS OCCURRED IN SEVEN ARITHMETIC ACTIVITY UNITS IN A FIFTH-GRADE CLASS

STEPS INCLUDED	ORDER OF OCCURRENCE OF STEPS						
	Unit I	Unit II	Unit III	Unit IV	Unit V	Unit VI	Unit VII
1. Finding fractional part of an integer using unit fractions only; product an integer	12	.....	13	.....	3	.....	4
2. Multiplying integer by a common fraction and vice versa. If cancellation possible, one term is common factor	5	2	9	1	1	3	5
3. Multiplying fraction by fraction. If cancellation possible, neither term is common factor	6	4	.....	.....	.....	.....	.....
4. Multiplying mixed number by integer or common fraction	2	1	1	9	6	2	3
5. Multiplying mixed number by mixed number	1	3	4	8	.....	7	7
6. Multiplying integer by mixed number using vertical form	10	.....	6	.....	.....	.....	6
7. Multiplying mixed number by integer using vertical form	9	.....	8	.....	.....	.....	.....
8. Multiplying three common fractions or mixed numbers	.....	.....	.....	.....	.....	.....	.....
9. Dividing an integer by a common fraction	.....	.....	.....	.....	.....	.....	.....
10. Dividing a common fraction by a common fraction	.....	.....	.....	.....	.....	.....	.....
11. Dividing a common fraction by an integer	.....	.....	.....	.....	.....	.....	.....
12. Dividing a mixed number by an integer or a common fraction	8	.....	3	2	.....	4	.....
13. Dividing an integer or a common fraction by mixed number	7	.....	5	10	.....	6	.....
14. Dividing mixed number by mixed number	4	.....	2	.....	.....	5	.....
15. Changing ounces to pounds	3	.....	11	.....	.....	.....	.....
16. Changing pounds to ounces	.....	.....	.....	.....	.....	.....	.....
17. Adding ounces and pounds	.....	.....	.....	.....	.....	.....	.....
18. Subtracting ounces and pounds	.....	.....	.....	*	.....	.....	.....
19. Changing inches to feet	.....	.....	12	.....	.....	1	.....
20. Changing feet to inches	.....	.....	.....	.....	.....	.....	.....
21. Changing yards to feet	.....	.....	.....	.....	.....	.....	.....
22. Multiplying United States money	11	.....	.....	4	5	9	1
23. Adding United States money	.....	.....	7	7	4	10	2
24. Subtracting United States money	.....	.....	10	.....	2	.....	8
25. Dividing integer by larger integer	.....	.....	.....	3	.....	8	.....
26. Changing pints to quarts	.....	.....	.....	6	.....	.....	.....

* In Unit IV Step 18 might have occurred nine times, but pupils preferred to change the ounces to a fractional part of a pound. Both methods were explained to the pupils.

carefully determined sequence from the simple to the complex. Table III shows that in none of our units was there the slightest approximation to an orderly arrangement of arithmetical steps. For example, in the first unit, the candy sale, the order of appearance of the processes was 5, 4, 15, 14, 2, 3, 13, 12, 7, 6, 22, and 1.

Was there any relation between the repetition of a step and the degree of mastery of the step?—We were interested to find out whether the

TABLE IV

RELATION BETWEEN NUMBER OF REPETITIONS AND MASTERY OF STEPS

Step Number	Repetitions		Mastery		Difference in Rank*
	Number of Repetitions	Rank of Step	Percentage of Mastery	Rank of Step	
4	112	1	87	8	7.0
2	50	2	94	5	3.0
5	31	3	71	13	10.0
12	24	4	84	9	5.0
13	14	5.5	76	10	4.5
15	14	5.5	60	15	9.5
25	11	7.5	94	5	2.5
1	11	7.5	97	1.5	6.0
14	10	9	73	11.5	2.5
6	9	11	55	16	5.0
7	9	11	68	14	3.0
18	9	11	94	5	6.0
3	8	13	94	5	8.0
8	0	15.5	42	17	1.5
9	0	15.5	97	1.5	14.0
10	0	15.5	94	5	10.5
11	0	15.5	73	11.5	4.0

* The average difference in rank is 6.0.

number of incidental repetitions of a process resulted in any learning advantage. We found that there was absolutely no relation between the number of repetitions of a step and the degree of mastery of the step. We arranged the steps (1) in the order of the number of repetitions and (2) in the order of degree of mastery, as is shown in Table IV. We found that there was an average difference of six places between the order on the basis of repetition of steps and the order on the basis of degree of mastery of steps. This difference does not, however, show the complete absence of connection between the two. To take a specific instance, Step 4, the multiplication of a mixed number by an integer or a common fraction, occurred 112 times in

the course of the seven units and resulted in a degree of mastery of 87 per cent. On the other hand, Step 9, dividing an integer by a common fraction, did not occur at all, and yet it resulted in a degree of mastery of 97 per cent. It is most interesting to observe that the first three of the six steps in the division of fractions (Steps 9, 10, and 11) did not occur at all in the seven functional arithmetic units of work, yet the percentages of mastery of these three steps were 97, 94, and 73, respectively. This finding in itself is worth further study because it suggests, what others have pointed out, that learning depends on factors other than mere repetition. Furthermore, it throws doubt on the value of the meticulous attention given to the amount and the distribution of practice by many authors of textbooks in arithmetic.

SUMMARY

1. In an arithmetic activity program based on real situations in school and social life, the pupils mastered 14.2 of the 17 fundamental processes included in the test on denominate numbers and on the multiplication and the division of fractions. This average is equivalent to a mastery of 84 per cent of the processes. If it is desired, the degree of mastery might be increased by the administration of two diagnostic tests at the middle and the end of the term followed by individual practice exercises.

2. The average intelligence quotient (113 on the National Intelligence Tests) for the experimental group was a very minor factor in accounting for the outcome of the experiment.

3. If what the pupils already knew at the beginning is eliminated, it is found that the pupils learned 79.5 per cent of the basic steps in the half-grade.

4. The fact that the arithmetical steps appeared in random order did not hinder the learning process.

5. The number of times which a step was repeated had nothing to do with the degree to which it was mastered.

6. Finally, at least under the condition of good teaching, an arithmetic activity program based on real situations in school and social life incorporating the basic arithmetical steps of a grade may be undertaken with considerable assurance that these steps will be mastered.

SUBJECT COMBINATIONS IN DEPARTMENTALIZED ELEMENTARY SCHOOLS

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STATEMENT OF PROBLEM AND METHOD OF PROCEDURE

The purposes of this study were (1) to determine, on the basis of practice and the judgments of experts, the most desirable subject combinations for teachers giving instruction in more than one subject in departmentalized intermediate grades in cities with populations of not more than 10,000 and (2) to determine, on the same basis, the correct order of the subjects in the daily program. More than 100 schedules, containing the daily programs of 566 teachers in 93 departmentalized elementary schools in 32 states, were studied. The elementary schools studied were either six-year or eight-year schools. The opinions of 68 experts in elementary education were used. The personnel of the body of experts included authors of textbooks on elementary education, outstanding teachers of elementary education in colleges and universities, directors and supervisors of elementary education, specialists in elementary education, elementary-school principals, high-school principals, superintendents, state and county officials, and psychologists. These experts indicated what they considered the most desirable combinations of school subjects in departmentalized intermediate grades. They also gave, in terms of class periods, the order in which the school subjects should be taught during the school day.

DESIRABLE SUBJECT COMBINATIONS

Of the 566 teachers studied, 112 were teaching only one subject; 221, two subjects; 201, three subjects; and 32, four subjects. Thus, a total of 454 teachers were giving instruction in more than one subject. The experts recommended fifteen different two-subject com-

binations that were found in actual practice. Other combinations were recommended that did not occur in actual practice, and vice versa.

TABLE I

MOST DESIRABLE TWO-SUBJECT AND THREE-SUBJECT COMBINATIONS RANKED ACCORDING TO SIXTY-EIGHT EXPERTS' OPINIONS OF THEIR DESIRABILITY AND ACCORDING TO OCCURRENCE IN ACTUAL PRACTICE

COMBINATION	RANK IN EXPERTS' OPINIONS	RANK IN ACTUAL PRACTICE	AVERAGE OF RANKS	RANK OF AVERAGE RANK	DIFFERENCE IN RANKS
	Two-Subject Combinations				
1. History and geography	1	7.5	4.25	4	6.5
2. Language and spelling	2	4	3.00	2	2
3. Arithmetic and science	3.5	4	3.75	3	0.5
4. Reading and language	3.5	1	2.25	1	2.5
5. History and language	5	12.5	8.75	5	7.5
6. Spelling and arithmetic	8	21	14.50	11	13
7. Geography and science	8	12.5	10.25	7	4.5
8. Reading and spelling	11	7.5	9.25	6	3.5
9. Geography and reading	11	12.5	11.75	9	1.5
10. Science and health	11	18.5	14.75	12	7.5
11. Arithmetic and health	13	10	11.50	8	3
12. History and special subjects	18	24.5	21.25	14.5	6.5
13. History and reading	18	9	13.50	10	9
14. Reading and penmanship	18	24.5	21.25	14.5	6.5
15. Arithmetic and reading	21.5	15.5	18.50	13	6
	Three-Subject Combinations				
1. Language, spelling, and reading	1	2	1.5	1	1
2. Spelling, language, and penmanship	3	4	3.5	3	1
3. Reading, history, and geography	4.5	9	6.75	5	4.5
4. Geography, arithmetic, and history	4.5	1	2.75	2	3.5
5. Arithmetic, science, and geography	6.5	3	4.75	4	3.5
6. Arithmetic, spelling, and language	13.5	8	10.75	6	5.5
7. Language, reading, and health	15.5	21	18.25	7	5.5

In Table I these fifteen two-subject and seven three-subject combinations are ranked in the order of frequency of mention by the experts and in the order of frequency of occurrence in actual practice. For example, the combination of history and geography ranks first in frequency of mention by the experts and 7.5 in frequency of occur-

rence in actual practice. On the basis of frequency of occurrence in actual practice and frequency of mention by experts, all the two-subject combinations given in Table I are permissible, but some are more desirable than others. When equal weights are assigned to frequency of occurrence in actual practice and to frequency of mention by experts, it will be observed from the rank of the average rank that the two-subject combinations are desirable in the following order, the first named receiving the most support.

Reading and language
Language and spelling
Arithmetic and science
History and geography
History and language
Reading and spelling
Geography and science
Arithmetic and health
Geography and reading
History and reading
Spelling and arithmetic
Science and health
Arithmetic and reading
Tie { History and special subjects
Tie { Reading and penmanship

The differences in the ranks given in the last column of Table I indicate that the combinations found in actual practice differed but little from the combinations recommended by experts with the possible exceptions of history and language, spelling and arithmetic, science and health, and history and reading. The most desirable subject to combine with history seems to be much in doubt.

It appears that all the three-subject combinations in Table I are permissible and fairly desirable. These combinations are preferred in the following order, the first named receiving the most support.

Language, spelling, and reading
Geography, arithmetic, and history
Spelling, language, and penmanship
Arithmetic, science, and geography
Reading, history, and geography
Arithmetic, spelling, and language
Language, reading, and health

The differences in ranks for the three-subject combinations show a marked extent of agreement between the ranks in actual practice and the ranks in the opinions of the experts. This statement must be considered in view of the fact that the ranks according to the experts' opinions and the ranks according to occurrence in actual practice were selected from a ranking of twenty-one different three-subject combinations given by experts and twenty-one combinations occurring in actual practice. In a total of twenty-one ranks a position deviation of 5.5 (the largest) is relatively small.

The four-subject combinations were conspicuous for their lack of agreement between the combinations found in actual practice and those recommended by the experts. Only two different combinations which occurred in actual practice were mentioned by the experts. One was a combination of arithmetic, spelling, reading, and language, which ranked seventh in the opinions of experts and second in actual practice. The other was a combination of language, reading, penmanship, and spelling, which ranked 9.5 in the opinions of the experts and fourth in actual practice. Neither history nor geography seemed to be combined consistently with any other fixed combination of three subjects.

As a concluding statement for this section, it will suffice to say that the experts' recommendations of various subject combinations were more uniform than were the combinations found in actual practice. Probably this result was to be expected since the experts set up what appeared to them to be a group of ideal combinations, barring all possible expediency measures, while the combinations found in actual practice were often the result of exigencies of the daily schedule. In many cases the existing combinations were not the combinations which the superintendents, the principals, and the teachers would have preferred, but, as is the case in many practical situations, propriety had been sacrificed for expediency.

PLACEMENT OF SUBJECTS IN THE DAILY PROGRAM

Whether there is a best time of day to teach a given subject is still a question worthy of serious study. To date the general tone of research findings on this problem seems to favor the conclusion that there is no best time of day for any of the elementary-school subjects. Sixty experts in elementary education and eight outstanding psychologists, the total of sixty-eight experts previously referred to, gave their opinions concerning the order in which the subjects should be taught. Their preferences are summarized in Table II. The rather marked agreement between the experts and the psychologists should be noted in the case of reading, arithmetic, spelling, geography, and history. The psychologists made no place for civics in their proposed daily program.

The order in which the subjects were taught, as given in the daily

programs of 566 teachers, is indicated in Table III. It should be noted that the totals for the various subjects are not the same for the

TABLE II

ELEMENTARY-SCHOOL SUBJECTS LISTED ACCORDING TO OPINIONS OF SIXTY EXPERTS IN EDUCATION AND EIGHT PSYCHOLOGISTS CONCERNING ORDER IN WHICH SUBJECTS SHOULD BE TAUGHT

School Period	Experts in Education	Psychologists
First	Reading	Reading
Second	Arithmetic	Arithmetic
Third	Language	Special subjects
Fourth	Spelling	Science
Fifth	Geography	Spelling
Sixth	Health	Geography
Seventh	History	Language
Eighth	Civics	History
Ninth	Science	Health
Tenth	Special subjects	.....

TABLE III

FREQUENCY WITH WHICH SCHOOL SUBJECTS ARE PLACED AT GIVEN PERIODS OF SCHOOL DAY IN DAILY PROGRAMS OF 566 TEACHERS

Subject	Frequency with which subject is taught in school period										
	1	2	3	4	5	6	7	8	9	10	Total
Reading	47	37	32	22	28	24	23	20	18	5	256
Arithmetic	95	49	40	33	50	30	23	14	1	0	335
Language	50	46	31	58	39	37	36	18	8	2	325
Spelling	30	25	22	23	28	27	16	16	1	0	188
Penmanship	25	20	17	20	28	20	13	12	4	4	163
Geography	25	27	20	17	25	23	33	18	5	3	196
Health	16	16	9	13	16	16	13	17	6	5	127
History	23	29	23	28	26	28	16	14	2	1	190
Science	18	17	16	16	29	19	15	16	4	2	152
Special subjects	31	35	25	25	25	25	21	26	20	10	243

reason that the teachers did not have the same subjects in their schedules. The frequencies for the various subjects, therefore, are not comparable with one another, but the frequencies for each sub-

ject are comparable and indicate tendencies for certain subjects to be taught at given periods.

At first sight, Tables II and III appear markedly inconsistent. Table III shows that many of the subjects were distributed over the entire school day. Nevertheless, there was some consistency between opinion and practice. Table III shows that arithmetic and reading were taught most frequently during the first and the second periods, while Table II indicates that the experts considered these periods the most desirable for the two subjects. The experts favored the third period for language, but in actual practice the fourth period was given the highest frequency for this subject. While the experts favored the fourth period for spelling, in actual practice this subject was distributed fairly well throughout the entire day. The most favored time for geography was near midday in both tables. The experts placed health near midday, while teachers in practice were teaching this subject at all times during the day. History was placed in the second and the last quarters of the day by experts, while it was taught at all hours during the day by teachers. Science was preferred in the latter part of the day by the experts, while it was taught most frequently near midday. The special subjects are distributed throughout the entire day in both tables.

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CONSISTENCY OF PUPIL RESPONSE ON TESTS OF READING COMPREHENSION

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As a part of a larger investigation carried on by the writer at the University of Iowa in 1931, an attempt was made to determine whether pupils are consistent in their responses to test items designed to determine their understanding of ideas found in the reading context. The point at issue is: If a test includes only one question regarding an idea found in the reading context, does the response to that one question represent a true picture of the pupil's understanding of the idea expressed in words in the reading context? Is it possible that a pupil will respond in one way to a particular question about an item in the reading context and, when confronted with another question regarding the same item, answer in a different way?

Two reading selections were used in this study. Both were taken from American-history textbooks in current use in the public schools. Selection A gave a description of Colonial lighting and contained 202 words. Selection C contained 265 words and consisted in a discussion of the Dred Scott decision. After a careful study of the reading selections, pencil-and-paper tests were devised by the writer in an effort to test exhaustively the pupils' understanding of the selections used. Tests of the following types were used: (1) a true-false test, (2) a multiple-choice test, (3) a free-expression inference test, (4) a true-false inference test, (5) a map test, and (6) a picture test. Every idea expressed in each of the reading selections was carefully tested in several different ways in the various types of tests used. During the administration of the tests the pupils were allowed to read the selections as many times as they wished. For this reason, the tests did not operate as recall tests. These tests were given to approximately fifty-five children of the eighth grade in a small town (2,500 population) in the Middle West.

The responses to all items testing similar ideas were grouped together, and the percentages of consistency were calculated. A pupil's responses were counted as consistent if all questions regarding a specific idea found in the context were answered consistently; that is, a pupil might be consistently right, consistently wrong, or inconsistent in his responses regarding any idea found in the context. One credit for consistency was recorded for each child when he responded consistently right or consistently wrong on all the questions regarding any idea found in the reading context. In some cases as many as five different questions were asked regarding the same idea found in

TABLE I

MEAN PERCENTAGES OF CONSISTENCY OF RESPONSES TO TEST ITEMS ON TWO READING SELECTIONS MADE BY GROUPS OF PUPILS DIVIDED ACCORDING TO INTELLIGENCE QUOTIENTS

Intelligence Quotient	Number of Pupils		Percentage of Consistent Responses	
	Selection A	Selection C	Selection A	Selection C
80–89	10	10	53.04	48.82
90–99	19	17	38.74	48.10
100–109	17	18	50.64	47.05
110–119	5	5	57.39	55.28
120–129	5	5	66.09	62.36

the context. No partial credits were allowed for varying numbers of consistent responses regarding specific ideas found in the selections because no workable method could be devised for so doing and because it was believed that, if a pupil had a clear picture in his mind regarding any idea symbolized in words in the selections, he would answer all questions consistently. Answering any questions inconsistently would show some confusion on his part.

The percentages of consistency of response for each child were computed by dividing the total number of his consistencies by the total possible number. The mean percentages of consistency of groups divided according to intelligence were then computed. Table I shows the results of this computation for the two selections. It will be noted that on Selection A the more intelligent children were

more consistent than the duller pupils. However, the best group was consistent in the responses only two-thirds of the time. The most inconsistent group was consistent little more than one-third of the time. If bright pupils can be depended on only two-thirds of the time and the duller pupils only one-third of the time, is one justified in putting much faith in investigations that make use of only single questions about any particular idea found in the reading context? Certainly one must be cautious in interpreting test results when only a small number of questions are used for a large amount of reading material.

The results on Selection C are in agreement with those on Selection A. The brightest group was consistent less than two-thirds of the time, while the most inconsistent group was consistent less than one-half of the time.

This study is subject to several limitations. It may be that some of the test questions were ambiguous or that certain test questions designed to test understanding of the same idea in the context were not exactly the same; that is, they did not test exactly the same idea. However, weeks of study were put on the reading selections, and the tests were revised again and again by the writer and two assistants in order to make the items as reliable and as valid as possible. It seems difficult to believe that the low percentage of consistency in the responses results from errors in the tests.

Since this study included only a small number of cases and since proper geographical distribution of the cases was not secured, no claim is made that the results secured for these children would hold for all children. However, it is probable that the results secured in this investigation would be found in similar studies of other children in various parts of the country, although probably in greater or less degree. Since standardized tests in reading are used in all parts of the country, test-makers need to take these results into account in constructing tests.

An inspection of individual pupil responses brought out the fact that the responses of some children on true-false-test items were inconsistent with their responses on multiple-choice-test items pertaining to the same idea. Their responses on map tests and on verbal tests were inconsistent. In fact, for some children inconsistencies

were found between any two of the various types of tests used. Certain children were able to respond to a map test correctly, but, when asked to answer on a verbal test a question about the same idea, they became confused and gave an answer exactly opposite to that which they had given on the map test.

These data seem to indicate clearly that one would not be justified in assuming that a correct picture of the reading comprehension of these children had been secured by the use of any one test item regarding any specific idea in the context in any type of test used here. This finding points strongly to the possibility that any one type of test or any one test item is not a sure guide to an understanding of pupils' reading comprehension.

It seems to the writer that these data strongly suggest the need for the use of greater caution in the preparation, the evaluation, and the interpretation of tests of reading comprehension than has been used in the past. The data also indicate need for the use of other techniques than those so far employed by students of education in investigations of reading comprehension. As a result of his study of the problems of reading comprehension by means of written tests (verbal, map, and picture), the writer is very much of the opinion that absolute reliance cannot at present be placed on the results of any of these methods of testing reading comprehension. Reading comprehension is, apparently, much too complicated a process to be thoroughly probed by the techniques used by investigators up to the present time.

In the testing of reading comprehension verbalism is one of the most difficult of problems. No techniques yet devised make sure that the pupils' answers in words carry for each child responding the same meaning as the answers carry for the test-makers and the investigators. Various techniques have been used in attempts to avoid the influence of verbalism, such as diagram tests, map tests, and picture tests. The results of this investigation indicate that none of these techniques is a solution of the problem of accurate measurement of reading comprehension.

SELECTED REFERENCES ON PRESCHOOL AND PARENTAL EDUCATION

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This bibliography[2] includes some of the more important publications that appeared during the period from December 1, 1932, to December 1, 1933. The plan of selection and classification is similar to that used last year, but because of limitations of space it has not been possible to include all references which one might have wished to include.

Technical and Experimental Studies

73. Anderson, John E. "The Relation of Differential Environments within a Given Culture to Child Care," *Fourth Conference on Research in Child Development*, Appendix G. Washington: Committee on Child Development, Division of Anthropology and Psychology, National Research Council, 1933.

    Shows the importance of controlling socio-economic status in studies of home influences on the child.

74. Bailey, Marjory W. "A Scale of Block Constructions for Young Children," *Child Development*, IV (June, 1933), 121–39.

    Photographs of forty-four constructions built by children were rated twice by one hundred adults using the method of equal-appearing intervals. Results showed that it was possible by this method to develop reliable scales for measuring block constructions of young children.

75. Baudouin, Charles. *The Mind of the Child.* Translated by E. and C. Paul. New York: Dodd, Mead & Co., 1933. Pp. 282.

    The mind of the child is examined from the point of view of the complexes existing in it, which are illustrated with actual observations.

[1] The writer wishes to acknowledge the assistance of Louise Gates in preparing this bibliography.

[2] See also Items 321, 332, and 339 in the list of selected references appearing in the May, 1933, number of the *School Review*.

76. BAYLEY, NANCY. *Mental Growth during the First Three Years.* Genetic Psychology Monographs, Vol. XIV, No. 1. Worcester, Massachusetts: Clark University Press, 1933. Pp. 1–92.

Describes a study of the mental development of a group of sixty-one normal infants by a graded series of tests given at short intervals from birth through three years.

77. BEASLEY, W. C. "Visual Pursuit in 109 White and 142 Negro New-born Infants," *Child Development*, IV (June, 1933), 106–20.

The first of a series of reports dealing with investigations of various problems concerning visual responses of new-born infants.

78. BEEBE, ELINOR LEE. "Motor Learning of Children in Hand and Eye Coordination with Introduction of Prismatic Deflection," *Child Development*, IV (March, 1933), 6–25.

An experimental study of children's learning.

79. BENJAMIN, HAROLD. "Age and Sex Differences in the Toy-Preferences of Young Children," *Pedagogical Seminary and Journal of Genetic Psychology*, XLI (December, 1932), 417–29.

Marked sex differences were shown both with regard to the final choice and with regard to the total length of time that a toy was played with in three out of six toys studied.

80. BRADBURY, DOROTHY E. "An Application of the Descoeudres Performance Tests to Fifty-seven American-born Four- and Five-Year Old Children," *Child Development*, IV (March, 1933), 79–89.

Presents results obtained by administering a modified form of the Descoeudres tests to fifty-seven children of four and five years of age.

81. BRIDGES, KATHARINE M. BANHAM. "Emotional Development in Early Infancy," *Child Development*, III (December, 1932), 324–41.

Presents a scale showing how the generalized emotional responses of infants and young children gradually become differentiated into more specific patterns.

82. BRIDGES, KATHARINE M. BANHAM. "A Study of Social Development in Early Infancy," *Child Development*, IV (March, 1933), 36–49.

The author traces certain trends of development in social behavior during the first two years of life.

83. CONRAD, HERBERT S. "The Personal Equation in Ratings. I, An Experimental Determination," *Pedagogical Seminary and Journal of Genetic Psychology*, XLI (December, 1932), 267–93.

Describes a procedure by which the effect of the personal error in teachers' ratings of preschool children may be reduced to a minimum.

84. CONRAD, HERBERT S. "The Validity of Personality Ratings of Preschool Children," *Journal of Educational Psychology*, XXIII (December, 1932), 671–80.

Finds a high reliability for ratings by nursery-school teachers on traits thought to be of central importance in the life of an individual child.

85. DAY, ELLA J. "The Development of Language in Twins. II, The Development of Twins: Their Resemblances and Differences," *Child Development*, III (December, 1932), 298–316.

Compares the resemblances and differences in a large number of mental and physical characteristics shown by twins of preschool age.

86. ELIOT, ABIGAIL A. *Eating Habits in Relation to Personality Development of Two- and Three-year Old Children.* Genetic Psychology Monographs, Vol. XIII, No. 5. Worcester, Massachusetts: Clark University Press, 1933. Pp. 399–481.

A study by observation and rating of the eating habits of sixty-nine nursery-school children.

87. ELLESOR, MARTHA VANCE. "Children's Reactions to Novel Visual Stimuli," *Child Development*, IV (June, 1933), 95–105.

Describes an experiment designed to test Watson's hypothesis that visual stimuli can arouse negative responses only by being conditioned to loss of support or to a loud sound.

88. GELLERMANN, LOUIS W. "Form Discrimination in Chimpanzees and Two-Year-Old Children," *Pedagogical Seminary and Journal of Genetic Psychology*, XLII (March, 1933), 3–49.

Part I of this article is entitled "Form (Triangularity) per Se"; Part II, "Form versus Background." Both children and chimpanzees learned to discriminate triangles from other figures in spite of changes in size and shape. The children showed evidence of distinguishing triangularity per se, but in the case of the chimpanzees the evidence for an abstract concept of triangularity was inconclusive. In Part II it is reported that both children and chimpanzees learned to discriminate a cross from other figures regardless of the background on which it appeared. The children learned more readily than the apes.

89. GRANDPREY, MEDORA B. "Range of Variability in Weight and Height of Children under Six Years of Age," *Child Development*, IV (March, 1933), 26–35.

Percentile curves of normal variability in height with age, in weight with age, and in height with weight for children under six years old are presented on the basis of data collected by Woodbury.

90. GRIGGSBY, OLIVE JOHN. "An Experimental Study of the Development of Concepts of Relationship in Preschool Children as Evidenced by Their Expressive Ability," *Journal of Experimental Education*, I (December, 1932), 144–62.

An account of an experiment designed to throw light on the development of ideas of causal relationship in the child. Four general stages are indicated. The method is in some respects similar to that used by Piaget.

91. HAGMAN, ELIZABETH PLEGER. *The Companionships of Preschool Children.* University of Iowa Studies in Child Welfare, Vol. VII, No. 4. Iowa City, Iowa: University of Iowa, 1933. Pp. 70.

Report of a study of the companionships of fifteen two-year-old and twenty-four four-year-old nursery-school children, as seen in spontaneous social contacts in the group and in two experimental situations.

92. HAGMAN, ELMER R. "A Study of Fears of Children of Preschool Age," *Journal of Experimental Education,* I (December, 1932), 110–30.

By means of an interview with parents, information regarding the specific fears shown by young children and a large number of related factors, including the fears felt by the mothers themselves and the methods used by parents in attempting to alleviate the children's fears, was secured and subjected to statistical analysis.

93. HALVERSON, H. M. "The Acquisition of Skill in Infancy," *Pedagogical Seminary and Journal of Genetic Psychology,* XLIII (September, 1933), 3–48.

Through the use of cinema analysis the author traces the development of the infant's ability to reach and grasp.

94. JERSILD, ARTHUR T. *Training and Growth in the Development of Children.* Child Development Monographs, No. 10. New York: Teachers' College, Columbia University, 1932. Pp. x+74.

Reports an experimental study in which groups of children who were given a three-month period of training in a series of mental and motor skills are compared with a paired control group who had no training.

95. JERSILD, ARTHUR T. "The Constancy of Certain Behavior Patterns in Young Children," *American Journal of Psychology,* XLV (January, 1933), 125–29.

A report of a follow-up study of children's behavior based on Arrington's work and using her observational technique.

96. KELLOGG, W. N., and KELLOGG, L. A. *The Ape and the Child.* New York: McGraw-Hill Book Co., Inc., 1933. Pp. xiv+342.

A pioneer study of the influence of environment on the early development of behavior, by the comparison of a chimpanzee and a human infant reared together for nine months in the human environment.

97. KOCH, HELEN LOIS. "Popularity in Preschool Children: Some Related Factors and a Technique for Its Measurement," *Child Development,* IV (June, 1933), 164–75.

Results suggest that the sociable child is not necessarily the popular child and that, on the whole, children prefer others of the same sex. Other related factors are considered.

98. KOCH, HELEN LOIS, and STREIT, HELEN. "A Study in Rating Technique with Special Reference to Activity in Preschool Children," *Pedagogical*

Seminary and Journal of Genetic Psychology, XLI (December, 1932), 330–57.

Shows that in preschool children the degree of physical activity varies with the kind of occupation in which the child is engaged.

99. LAUTERBACH, C. E. "The Measurement of Handedness," *Pedagogical Seminary and Journal of Genetic Psychology*, XLIII (September, 1933), 207–12.

Description of a "Habit Scale of Handedness" developed to measure percentage of right-handedness in an individual. The scale was standardized on 1,061 subjects ranging in age from less than a year to 70 years.

100. LINCOLN, E. A. "Preliminary Report on the Stanford Binet IQ Changes of Superior Children," *Journal of Experimental Education*, I (March, 1933), 287–92.

Retests of ninety-three kindergarten children showed a tendency toward loss in intelligence quotient after a period of five to eight years.

101. MCGRAW, MYRTLE B. "From Reflex to Muscular Control in the Assumption of an Erect Posture and Ambulation in the Human Infant," *Child Development*, III (December, 1932), 291–97.

Describes the successive stages in the development of the ability to stand and walk.

102. MARQUIS, DOROTHY P. "A Study of Activity and Postures in Infants' Sleep," *Pedagogical Seminary and Journal of Genetic Psychology*, XLII (March, 1933), 51–69.

Shows that sleep becomes progressively quieter with advancing age during the first year and that postures and movements during sleep present further evidence of antero-postero and proximal-distal gradients of behavior development.

103. MATTSON, MARION L. *The Relation between the Complexity of the Habit To Be Acquired and the Form of the Learning Curve in Young Children.* Genetic Psychology Monographs, Vol. XIII, No. 4. Worcester, Massachusetts: Clark University Press, 1933. Pp. 299–398.

Shows that specific practice is more important in the learning of a complex maze pattern than is the case with a more simple pattern.

104. MILES, KATHERINE A. "Sustained Visual Fixation of Preschool Children to a Delayed Stimulus," *Child Development*, IV (March, 1933), 1–5.

The results suggest that visual attention is brief at the third-year and fourth-year levels but increases markedly at five and six years.

105. PARTEN, MILDRED B. "Social Participation among Preschool Children," *Journal of Abnormal and Social Psychology*, XXVII (October–December, 1932), 243–69.

Observations of spontaneous play groups showed that the size of the group tends to increase with age and that preschool children most frequently play with others of the same sex and age, though not necessarily of the same intelligence.

106. PARTEN, MILDRED B. "Leadership among Preschool Children," *Journal of Abnormal and Social Psychology*, XXVII (January–March, 1933), 430–40.

Demonstrates use of time-sampling technique in measuring leadership and shows definite individual characteristics regarding this trait at the preschool level.

107. RAZRAN, GREGORY H. S. *Conditioned Responses in Children.* Archives of Psychology, Vol. XXIII, No. 148. New York: Columbia University, 1933. Pp. 120.

Brings together the significant experimental facts regarding the conditioning of behavior in young children. Includes much work not previously summarized in English.

108. ROBERTS, KATHERINE ELLIOTT. *Learning in Preschool and Orphanage Children.* University of Iowa Studies in Child Welfare, Vol. VII, No. 3. Iowa City, Iowa: University of Iowa, 1933. Pp. 94.

A study of ability to solve different situations according to the same plan. Results show that mental and chronological age are more important factors in the original solution of the problems used than in the ability to apply the same method of solution to other problems.

109. SCOE, HJALMAR FLETCHER. *Bladder Control in Infancy and Early Childhood.* University of Iowa Studies in Child Welfare, Vol. V, No. 4. Iowa City, Iowa: University of Iowa, 1933. Pp. 84.

Reports a study of the various psychological factors related to the establishment of bladder control. Questionnaires, observations, and an experimental training group were used. Optimal age and conditions for training are suggested.

110. SHACTER, HELEN S. "Intelligence as a Causal Factor Determining Differences in Sustained Attention in Preschool Children," *Journal of Applied Psychology*, XVII (August, 1933), 478–88.

In a study of thirty-six preschool children the correlation between average attention span and a composite intelligence quotient was low.

111. SHIRLEY, MARY M. *Intellectual Development. The First Two Years*, Vol. II. Institute of Child Welfare Monograph Series, No. VII. Minneapolis, Minnesota: University of Minnesota Press, 1933. Pp. xvi+514.

Deals with the intellectual development of the author's group of twenty-five babies, as seen in the performance of various motor and psychomotor tests administered in the home.

112. SHIRLEY, MARY M. *Personality Manifestations. The First Two Years*, Vol. III. Institute of Child Welfare Monograph Series, No. VIII. Minneapolis, Minnesota: University of Minnesota Press, 1933. Pp. xii+228.

This final volume in Shirley's study deals with the manifestations of personality characteristics as observed by the investigators and reported by the mothers.

From the first, each child exhibited ways of behaving which were unique and showed a distinct personality.

113. SKEELS, HAROLD MANVILLE. *A Study of Some Factors in Form Board Accomplishments of Preschool Children.* University of Iowa Studies in Child Welfare, Vol. VII, No. 2. Iowa City, Iowa: University of Iowa, 1933. Pp. 148.

A report of the significance of such factors as position, size, and shape of objects in the form-board accomplishments of preschool children.

114. SMITH, MADORAH E. "Grammatical Errors in the Speech of Preschool Children," *Child Development*, IV (June, 1933), 183–90.

An analysis of the spontaneous conversation of 220 children, ranging in age from eighteen months to six years.

115. STAPLES, RUTH, and ANDERSON, ANGELINE C. "A Study of Outdoor Play, Appetite and Afternoon Sleep of Young Children," *Child Development*, IV (June, 1933), 191–95.

Little relation was found between the amount of morning outdoor play and noon food consumption or between the latter and the afternoon nap.

116. UPDEGRAFF, RUTH. "Preferential Handedness in Young Children," *Journal of Experimental Education*, I (December, 1932), 134–39.

Describes a test for determining hand preference in young children. Little or no age differences in hand dominance was found between the ages of two and six years—a finding which suggests that hand dominance is well established before the age of two.

117. UPDEGRAFF, RUTH. "The Correspondence between Handedness and Eyedness in Young Children," *Pedagogical Seminary and Journal of Genetic Psychology*, XLII (June, 1933), 490–92.

In children between the ages of two and six years, greater correspondence was found between right-handedness and right-eyedness than between left-handedness and left-eyedness, but in neither case was the relation invariable.

118. UPDEGRAFF, RUTH, and HERBST, E. K. "An Experimental Study of the Social Behavior Stimulated in Young Children by Certain Play Materials," *Pedagogical Seminary and Journal of Genetic Psychology*, XLII (June, 1933), 372–91.

Describes the variations in social behavior associated with the use of different play materials.

119. WARING, ETHEL B. "A Guide for Studying the Personality of a Young Child," *Journal of Experimental Education*, I (December, 1932), 96–109.

Describes a method whereby the child's behavior either in an everyday or a controlled situation may be classified.

120. WELLMAN, BETH L. "The Effect of Preschool Attendance upon the I.Q.," *Journal of Experimental Education*, I (December, 1932), 48–69.

Presents further evidence apparently showing that attendance at a nursery school brings about an increase in the intelligence quotient from autumn to spring, while the period from spring to autumn when the school is not in session is not marked by any appreciable change in test standing.

121. WILLIAMS, HAROLD M., SIEVERS, CLEMENT H., and HATTWICK, MELVIN S. *The Measurement of Musical Development.* University of Iowa Studies in Child Welfare, Vol. VII, No. 1. Iowa City, Iowa: University of Iowa, 1933. Pp. 192.

Deals with certain problems basic to the investigation of musical development in young children. Presents tentative scales for the measurement of rhythmic ability and for the study of pitch inflection in children's speech.

122. YOUNG, PAUL THOMAS. "Food Preferences and the Regulation of Eating," *Journal of Comparative Psychology*, XV (February, 1933), 167–76.

Shows the complexity and variability of hunger, appetite, and food preferences and their dependence on such factors as diet and disease.

NON-TECHNICAL BOOKS AND ARTICLES PRIMARILY FOR PARENTS, TEACHERS AND WORKERS IN THE FIELD OF PARENT EDUCATION

123. ALSCHULER, ROSE (Editor). *Two to Six.* New York: Wm. Morrow & Co., 1933. Pp. 160.

This book of suggestions for parents of young children is the result of the co-operative efforts of the author and the preprimary faculty of the Winnetka Public Schools in preparing a "unified continuous curriculum." Habit-formation, literature, music, and play are considered, and lists of books and materials appropriate for the preschool ages are included.

124. ANDERSON, JOHN E. *Happy Childhood.* New York: D. Appleton-Century Co., Inc., 1933. Pp. xx+322.

A discussion of the development and guidance of the child from birth to maturity.

125. ARBUTHNOT, MAY HILL. "Content in the Kindergarten Curriculum," *Journal of the National Education Association*, XXII (February, 1933), 41–43.

A comparison of the qualifications of the teacher and the subject matter taught in the kindergarten of ten years ago with present conditions.

126. DAVIS, MARY DABNEY, and HANSEN, ROWENA. *Nursery Schools: Their Development and Current Practices in the United States.* United States Office of Education Bulletin No. 9, 1932. Pp. vi+92.

An analysis of the administration and the operation of nursery schools.

127. FOSTER, JOSEPHINE. *Busy Childhood.* New York: D. Appleton-Century Co., Inc., 1933. Pp. xx+304.

Describes types of activities suitable for different ages and under different conditions, such as vacations and illness.

128. FREEMAN, G. LA VERNE, and FREEMAN, RUTH SUNDERLIN. *The Child and His Picture Book.* Evanston, Illinois: Northwestern University Press, 1933. Pp. 102.

Describes the kind of picture-books preferred by children of nursery-school age.

129. JACK, LOIS M. "A Device for the Measurement of Parent Attitudes and Practices," *Researches in Parent Education, I*, pp. 137–49. University of Iowa Studies in Child Welfare, Vol. VI, Part IV. Iowa City, Iowa: University of Iowa, 1932.

By means of a standard interview, information was obtained from mothers concerning their practices in child-rearing before and after a course in parent education. There was considered to be a slight improvement during the four-month training period.

130. LOCHHEAD, JEWELL. *The Education of Young Children in England.* Teachers College Contributions to Education, No. 521. New York: Teachers' College, Columbia University, 1932. Pp. vi+226.

A critical comparison of English nursery schools, kindergartens, and infant schools with those in the United States.

131. OJEMANN, RALPH H. "A Standard for Estimating the Validity of Child Development Principles," *Researches in Parent Education, I*, pp. 95–114. University of Iowa Studies in Child Welfare, Vol. VI, Part II. Iowa City, Iowa: University of Iowa, 1932.

A method of developing a standard for estimating the validity of child-development principles as part of a program of research in parent education is described and illustrated by materials on training in eating habits.

132. PRUETTE, LORINE. *The Parent and the Happy Child.* New York: Henry Holt & Co., 1932. Pp. 290.

Considers the psychology of family life and of child development. Contains an inventory of parental attitudes.

133. REMER, LAURA L. "Handicaps of School Entrants: A Study of Traits Which Handicap Children Entering Kindergarten and First Grade," *Researches in Parent Education, I*, pp. 197–207. University of Iowa Studies in Child Welfare, Vol. VI, Part VI. Iowa City, Iowa: University of Iowa, 1932.

Nineteen teachers rated 734 children, who were entering school, on handicaps thought to be the causes for difficulties grouped as personality, intellectual, and language difficulties. Twenty per cent of the children were considered to be handicapped in one or more ways.

134. SCHICK, BÉLA, and ROSENSON, WILLIAM. *Child Care Today.* New York: Greenberg, Publisher, Inc., 1932. Pp. 320.

Contains chapters on prenatal care, infancy, the preschool child, and children's diseases. The book is written for mothers.

135. STODDARD, GEORGE D. "A Survey of Nursery School Costs," *Journal of Educational Research*, XXVI (January, 1933), 354–59.
An itemized survey of costs based on reports from sixty nursery schools

136. STODDARD, GEORGE D. (Editor). "Personality and Behavior of Children," *Childhood Education*, IX (April, 1933), 339–78.
The entire number is devoted to a series of papers on this subject.

137. STUART, HAROLD C. *Healthy Childhood*. New York: D. Appleton-Century Co., Inc., 1933. Pp. xxviii+394.
Deals with the parents' problems in aiding the child in acquiring and maintaining a healthy body.

138. THOMPSON, DOROTHY CANNON, and WASHBURN, RUTH WENDELL. "An Explanatory Outline for Lay Observers of Nursery Groups," *Childhood Education*, IX (May, 1933), 406–8.
Specific suggestions of what to look for when observing play groups or nursery-school groups of children.

139. WAGONER, LOVISA C. *The Development of Learning in Young Children*. New York: McGraw Hill Book Co., Inc., 1933. Pp. xiv+322.
Considers some of the steps by means of which the child acquires more efficient ways of responding in many situations.

Educational Writings

REVIEWS AND BOOK NOTES

An evaluation of teacher-rating practices.—The general question of the rating of teachers is not so prominent in educational circles as it was ten or fifteen years ago. Most administrators have made their decisions with regard to the use of rating schemes and have ceased arguing about the merits of the procedure. The National Education Association reported in 1928 that in 657 cities teachers were definitely rated on the quality of service rendered and that in 67 of these cities the teachers' ratings determined the amounts of the salary increases for the following year.

A dissertation[1] having to do with the rating of teachers should be of general interest provided the reader understands just what object the author had in mind in making the study. The author writes that in his study he made no attempt to prove or disprove the argument that teachers' salary schedules should be based in whole or in part on merit-rating as a measure of teaching efficiency and that he does not plead for the adoption or the continued use of the merit-type salary schedule. The study attempts to help those school executives who use merit-rating as a basis for salary schedules.

By a liberal use of quotations from such authorities in the field of education as Barr, Boyce, Cubberley, Elliott, Evenden, Knight, McCall, Rugg, and Starch, the author sets up a list of thirteen criteria or standards to govern the use and the administration of merit-rating as a basis for salary schedules. With these standards as measuring rods, he proceeds to evaluate merit-rating as practiced in fifty-nine different cities scattered throughout twenty states. The populations of these cities range from five thousand to one hundred thousand. In New York, New Jersey, Connecticut, and Delaware, the author visited the nine cities included in the study; from cities in other states information was secured by means of correspondence.

The results of the application of these standards are both interesting and illuminating. Most of the cities now using merit-rating as a basis for salary schedules have a long way to go if they are to bring their procedures up to the

[1] Lloyd Percy Young, *The Administration of Merit-Type Teachers' Salary Schedules.* Teachers College Contributions to Education, No. 552. New York: Teachers College, Columbia University, 1933. Pp. x+104. $1.50.

standards developed by Young. In most of the cities studied the teachers have had little to do with preparing the scale on which their salary-schedule increases are based. In many cases little effort has been made to put the rating scheme on an objective basis. Forty-six per cent of the systems rated their teachers only once a year, instead of four times as the study recommends. Perhaps the most significant fact brought out by the investigation is the high ratings given teachers in most of the fifty-nine cities. The distribution curve of the ratings of the teachers is almost never normal but is decidedly skewed toward the higher ranges. In one system using three merit groups (A, B, and C) 130 teachers were rated A, 20 were rated B, and no teacher was rated C. The study makes it very evident that rating teachers is a most difficult task and, where used, is open to serious criticism.

Every school administrator now using teacher-rating as a basis for determining salaries should read this study and check his procedure. Certainly any school administrator who is considering the introduction of teacher-rating into his school system will find it greatly to his advantage to familiarize himself with Young's study.

FLOYD T. GOODIER

ASSISTANT STATE SUPERINTENDENT OF PUBLIC INSTRUCTION
SPRINGFIELD, ILLINOIS

Another introductory textbook in the field of education.—Determination of the content is a major problem to those who attempt to offer a general introductory course in the field of education. When such a course has been evolved, its content has been influenced by local "vested interests" and the personal interests of the instructor or the group of instructors offering it. Not infrequently the course as offered has appeared to contribute in an effective fashion to the training of prospective teachers, and the instructor is encouraged to expand his outline and offer the manuscript as a textbook to be used in other institutions. When published, the textbook is tried out, but in general it is found to be not particularly satisfactory. Such experiences cause one to wonder whether the success of the course in the institution where it was developed was not due largely to peculiar local conditions or to the personality of the instructor involved.

This query persisted in the mind of the reviewer as he read the pages of *An Orientation Course in Education*.[1] The content of the volume is organized about twenty-one problems grouped into six "units" bearing the following captions: "How the School of Today Came To Be," "Unrealized Ideals or the School of Tomorrow," "The Scientific Method in Education," "Guiding the Learner," "The Machinery of Our Schools," and "The Teacher." Following the discussion

[1] Joseph S. Butterweck and J. Conrad Seegers, *An Orientation Course in Education*. Boston: Houghton Mifflin Co., 1933. Pp. vi+392. $2.00.

of each problem there are a list of questions and a small number of collateral readings. Each chapter ends with a bibliography. The authors have attempted to formulate "the major problems of the curriculum, teaching, administration, and educational research" (p. vii) and to deal with these problems in a way that will give the student "a new set of guiding principles which [will] enable him to become intelligently critical of the school practice to which he was subjected in the past, and to give him also the organized college experiences which are designed to equip him for the kind of school which his new philosophy visions as the ideal" (p. vi).

Although the authors announce that they have avoided an encyclopedic treatment and the number of problems is not large, the scope of the volume is certainly not narrow. For example, under the heading of the first problem, "The Story of Education," the history of education is sketched from primitive times down to John Dewey—in nineteen pages. Schools of different lands (England, France, Germany, and Russia) are disposed of in four pages. Less comprehensive topics would seem desirable in an introductory course in education. If the history of education is to be treated, it probably should be restricted to the modern period. Three problems are dealt with in the chapter on "The Scientific Method in Education": Problem A, "What Is the Scientific Method?" Problem B, "What Are Its Possibilities in Education?" Problem C, "What Instruments of Research Have Been Developed for the Educator?" The discussion of these problems gives the reader a very inadequate idea of the modern research movement. Furthermore, the collateral readings will not help him very much. On the whole, the book impresses the reviewer as rather highly abstract and philosophical and not suitable for a student audience of the type which the authors appear to have had in mind.

Several minor criticisms may be noted. In a few cases secondary sources are used. The collateral readings and the chapter bibliographies are not up to date and do not appear to have been wisely selected. A casual examination revealed an erroneous date and an incorrect authorship of a reference. Certain pictures appear at the beginning of the several chapters; but they are without captions, except in the case of the final chapter, and their intended function is not apparent to the reader.

In the judgment of the reviewer, this volume cannot be regarded as an important contribution to educational literature. In the hands of a widely read and skilful instructor it might be an effective textbook, but in other situations it probably will not be considered satisfactory.

WALTER S. MONROE

UNIVERSITY OF ILLINOIS

Local school control in Massachusetts.—Educational leaders in states that patterned their school organizations after the local-district system developed in Massachusetts during the late Colonial period and the first century of state-

hood should read with interest a study[1] which analyzes and describes the current methods of school administration in the state. The study should prove especially valuable to students of school administration and to school officers in town and city school systems.

The merits of the Massachusetts school system are attributed to two influences, namely, (1) a century of able leadership in the position of state commissioner of public education—a leadership the power of which has consisted in the ability of the leaders to educate, to persuade, and to direct, rather than to coerce—and (2) the traditional method of local government in which both civil and school policies are discussed in town meetings. The latter influence is believed to have resulted in the thorough dissemination of the ideals of public education among the citizens of Massachusetts and has kept alive their interest in popular education. As a result, the legislature and the courts have constantly adhered to policies singularly sympathetic toward education with respect to provisions for its organization, control, and support, and the interpretation of these provisions when called in question.

Since the abolishment of the district system in 1882, the unit of civil and educational administration in Massachusetts has been the town or the city. The state is organized at present into 355 local units, 39 of which are cities and the remainder towns. The people at an annual town meeting elect officers, decide general policies, and appropriate funds. The officers elected have responsibilities for general government and schools. The school committee and the selectmen of the town have concurrent authority in the administration of the schools. The former, for example, contract expenditures, but the latter approve the bills. The school and the civil affairs of the towns are therefore closely related. The same intimate relation is maintained between education and government in the cities. This relation is a subject of much controversy. Political economists and politicians generally favor the plan; school officers and students of educational administration are generally opposed.

Other features of school administration discussed in the volume are the following: the local organization for administration and supervision, designated in Massachusetts as "the superintendency union"; the legal basis, the personnel, the organization, and the methods of administration of the school committee; the status of the superintendent of schools; problems pertaining to the fiscal control of schools; the relations of auxiliary school functions to local government; and the relations of the schools to the public. Space requirements prevent discussion of these phases of school administration. Persons interested in the relations of the school and community should read the volume in full.

The reviewer believes that the development in local school control in Massachusetts has produced results which must be striven for throughout the country

[1] L. Leland Dudley, *The School and the Community:* A Study of Local Control in the Public Schools of Massachusetts. Harvard Studies in Education, Vol. 22. Cambridge, Massachusetts: Harvard University Press, 1933. Pp. xiv+176. $2.50.

regardless of the form of school organization in vogue. Perhaps the parent-teachers' associations in other sections of the country can be made to approximate in function the Massachusetts town meeting. If so, the heritage of ideals with respect to public education may be preserved among the people in general. The detachment of education from civil administration in many states causes education to gain in some respects and, without doubt, to lose in others. Dudley's study should contribute much to the clarification of the results to be expected from popular participation in school affairs by supporting communities.

WILLIAM C. REAVIS

A unique book in the field of primary art instruction.—Children who use *Art Stories*[1] will peruse it eagerly because it ministers to the universal joy in beauty. The purpose of the book is to keep this joy growing by the powerful process of telling stories in which activities in art form the plot and beauty is the hero.

These experiences in perception and creation of beauty are purposeful and comprehensive, such as seeing and discussing the colors of the rainbow and finding the same colors elsewhere; observing landscape beauty in both nature and art; drawing and modeling animals; making toy houses, towns, and parks; building a birdhouse; attaining beauty in the Christmas activities of toy-making, package-wrapping, and tree-decorating; seeing beauty and order in the playroom, a doll's house, and costumes; discussing "Baby Stuart" and other related pictures.

The authors avoid giving set lessons and pedantic directions but skilfully induce activity in thinking and doing where beauty is the end. The illustrations are admirable; the saturated colors, well harmonized, which are used on nearly every page are a triumph indeed and will cause the book to be treasured by anyone, young or old, who obtains it. The text uses a simple vocabulary, approved for first-grade comprehension, and will induce assimilation in a way that the merely sensuous pleasure of looking at the pleasing color and form designs in the book might not alone accomplish.

Many books on art appreciation, both in choice of examples and in discussions, overemphasize sentimentality, use pictures as texts for moralizing, and praise the artist only for his imitative skill and not for his power in design construction (as well study a great writer for his spelling). This book avoids these pitfalls; it is fresh, stimulating, and vigorous in getting directly at art matters.

If the series extends to the capacity of high-school pupils, it can perform a real service by broadening the usual range of picture-study. Giotto, Signorelli, Michelangelo, El Greco, Van Gogh, Renoir, Cézanne, Demuth, etc., have a sturdy strength which is too little emphasized in the study of the usual lists, which include such artists as Raphael, Murillo, Millet, Corot, Monet, Whistler,

[1] William G. Whitford, Edna B. Liek, and William S. Gray, *Art Stories*, Book One. Chicago: Scott, Foresman & Co., 1933. Pp. 144. $0.68.

Rosa Bonheur, etc. Again, the choice made from the works of great artists is often emasculated by including only their weaker examples.

A far-reaching application of design principles in the study of paintings, sculptures, architecture, and everyday articles is a much-needed supplement to a study of the sentimental, superficially pretty, and photographic aspects of art.

This book is the most sturdy step in the right direction which I have seen in the field of primary art instruction.

ARTHUR B. CLARK

PROFESSOR EMERITUS OF EDUCATION IN GRAPHIC ART
STANFORD UNIVERSITY

Methods and plans for teaching music in rural schools.—Textbooks in music for use in rural or one- and two-room schools have appeared occasionally, but a treatise telling teachers not only what to teach in such situations but how to teach it is unique. Such a book, however, has been published.[1] It discusses the place and the aims of music in rural education, subject matter, the music program, and procedures and outcomes of teaching.

Recognizing the fact that conditions change from time to time and from place to place, the authors outline in some detail four types of plans to care for the needs and the interests of pupils and to provide satisfactory training: the rote plan, the project plan, the chorus plan, and the monthly-outline plan. It is the thesis of the authors that music instruction at all times should develop appreciation for good music. To this end, they urge teachers to consider individual differences of children and to plan lessons which will give proper opportunity to every child to participate in musical activities according to his capacity. Thus, some children will master the musical score, while others will learn only the most rudimentary facts about notation.

Unless instruction in music is such that the child thinks it an interesting and a worth-while subject and utilizes it generally in school, home, and community, its value as an educational or a cultural subject is slight. In this connection, suggestions for an integrated curriculum which stresses the learning of music, not only for its own sake, but for its use in other fields, such as history, geography, literature, art, and physical training, are timely and valuable.

The section of the book devoted to methods of teaching treats briefly but clearly of voice, music appreciation, correlation, the rhythm band, rhythm play, and the scheduling of the music period. A list of correlating recorded selections, a chapter on musical theory, and several daily programs of studies in rural schools are included to aid the teacher.

The Preface of the book states that it is not the purpose of the writers to give

[1] Osbourne McConathy, W. Otto Miessner, Edward Bailey Birge, and Mabel E. Bray, *Music in Rural Education:* A Program for the Teacher in One- and Two-Room Schools, Based on "The Music Hour," One-Book Course. Newark, New Jersey: Silver, Burdett & Co., 1933. Pp. xiv+290. $1.20.

a philosophical discussion of music but rather to offer a plan of work for rural schools based on the One-Book Course of *The Music Hour* series. Although this plan limits its treatment and, to a certain extent, its usefulness, the practical and progressive suggestions set forth make the book a helpful manual for all teachers whether in rural or urban schools. It is, therefore, a welcome contribution to the limited number of books on music education now available.

ANNE E. PIERCE

UNIVERSITY OF IOWA

Junior high school language.—The past decade has witnessed a most remarkable advance in the writing of textbooks for instruction in English. In the place of the dull, uninteresting books of rules or the even more forbidding manuals of drill, we now have series of bright, attractive volumes which in point of format are more alluring than the novels of twenty years ago and in content are designed primarily to meet the interests, the activities, and the needs of the pupils. The authors of *Junior English in Action*[1] have availed themselves of every advance in the writing and the printing of textbooks and have added unique features of their own. The result is a series of textbooks with every aid to the teacher that attractiveness, clarity, and orderly development can provide.

The leading feature of this series is its emphasis on conversation and oral discussion. While some of the model conversations seem a little stilted and the aim of making the pupil "speech conscious" may be open to objection, the practical exercises calling for free and interesting conversation are numerous and extraordinarily good. The major emphasis in Book One is on speech activities —informal conversations, telling stories, explaining something. In the other volumes, though written composition is of course more prominent, speech is never neglected and the social graces of conversation are admirably worked in.

Other outstanding features are the inclusion of a penmanship scale, to motivate pupils to improve their writing; the use of pupil exercises, rather than literary selections, as models for motivation of writing and speaking; and the profuse use of illustrations, unusual in subject and interesting to a high degree.

The language program quite properly places emphasis on the sentence. Book One, for Grade VII, concentrates on the subject and the verb, the punctuation of simple sentences, and the recognition of the major parts of speech. Book Two reviews and extends the simple sentence and moves on to compound and complex sentences, which are developed and extended in Book Three. The treatment of the sentence is excellent, but the amount of concomitant grammar seems to the reviewer far too large. The discussion in Book Two of transitive and intransitive verbs, active and passive voice, and of participles, gerunds, and infinitives might well be postponed one or two grades, with a resultant improvement in the mastery of the sentence in Grade VIII.

[1] J. C. Tressler and Marguerite B. Shelmadine, *Junior English in Action:* Book One, pp. xiv+350, $1.00; Book Two, pp. xiv+420, $1.08; Book Three, pp. xiv+460, $1.16. Boston: D. C. Heath & Co., 1933.

Word study and the use of the dictionary are well represented, in addition to stimulating exercises on "The Right Word." Space forbids more than mention of the inviting sections on letter-writing, report-making, précis-writing, and the use of the library. With the exception of the overloaded grammar program and the failure to note the social appropriateness of different levels of usage, *Junior English in Action* is an exceptionally bright, vigorous, and well-written series of language books for the junior high school, admirably suited to the needs and interests of pupils in Grades VII, VIII, and IX.

ROBERT C. POOLEY

UNIVERSITY OF WISCONSIN

American history for the middle grades.—In contrast with several recent histories for the elementary school which either emphasize the life of the people or attempt a more than ordinarily mature interpretation of the development of American society, this new textbook[1] follows more conservatively the usual elementary-school narrative of American development, stressing settlements, explorations, additions of territory, and, to a less extent, wars. Beginning where the same authors' *Finding America* left off, the new volume distributes its emphasis one-half to the Colonial period, one-third to the period from the Revolution through the Civil War, and one-sixth to the developments after the Civil War. The most recent period actually receives a much smaller fraction because this part of the book includes brief topical histories of invention, transportation, and communication, substantial parts of which are concerned with developments before 1865. The rather miscellaneous character of this last part of the book is somewhat typical of the entire volume. In addition to the topical histories there are chapters on Edison, polar exploration, and the World War.

To motivate the narrative, the authors plan to use biographical materials as much as possible. This plan is carried out with considerable success, and the purely biographical is usually distinctly subordinated to the general account. Each of the six large divisions of the book is introduced by a small group of questions and activities addressed to the pupil. Each chapter then is introduced with a brief overview. At the end of the chapter is a pupil's self-test on what he has just read. The test is followed by suggestions for activities, thought questions, and a list of new words. To each large division is appended a brief list of parallel textbooks, and at the end of the volume appears a valuable group of suggestions to teachers. The narrative is characterized by short sentences and a simple vocabulary suitable for fifth- and sixth-grade pupils.

The authors frankly state that the book does not undertake to teach an organized body of facts but to interest children in history, to arouse their curiosity for further study, and to give meaning to the institutions and national traditions of the United States through a series of incidents connected by a slight plot. That this book will interest pupils can be granted, but that it will develop a sub-

[1] Olive E. Smallidge, with the collaboration of Frederic L. Paxson, *Builders of Our Nation*. Boston: Houghton Mifflin Co., 1933. Pp. viii+632. $1.36.

stantial sense of continuity may well be doubted. Only two phases tend to give an understanding of the development of American society: first, the reasonably chronological account of the settlement and the territorial growth of continental United States and, second, the brief topical accounts of invention, transportation, and communication. If we are to justify history as a separate course at the grade level for which this book is intended, it seems that we must do better than that; for a group of selected historical tales in the readers will do as much.

One may well ask, "What have the explorations of Peary and Byrd to do with American development as compared with the rise of the city or the change from handicraft to machine manufacture?" In contrast to the opinion of the authors of this volume, many teachers feel that they are teaching simple concepts of these developments successfully in the middle grades. Unless these teachers are mistaken, *Builders of Our Nation* defers too much to the pupils' affection for interesting stories.

ELMER ELLIS

UNIVERSITY OF MISSOURI

Evaluating the school health program.—Few, if any, fields of education have received more subjective treatment in proportion to objective analysis than has that of health. It is refreshing, therefore, to read a new monograph[1] published by the American Child Health Association. The two aims of the monograph are clearly stated: "to find the qualities underlying school health results and to evaluate a sampling of public schools in respect to these qualities" (p. 5).

What might be done in a health program and what really is done are two different things, declares this author. He then describes the method of procedure employed in the study as an attempt to evaluate the health programs of the schools in terms of health achievement made by the children.

By use of careful and detailed examinations covering selected items, an attempt was made to determine the degree to which teachers were aware of their pupils' health deficiencies. Examinations of the children under properly controlled conditions were then made, and the statistical comparison of these results with the teachers' statements showed both the degree to which the teachers were aware of deficiencies and the extent to which they were capable of correctly diagnosing symptoms.

There is no questioning the statistical procedures involved. A full description of the technique is given in the appendixes, together with wide samplings of health procedures and test materials and a full description of the measures of health practice and knowledge. While the monograph is designed in general for the non-statistical reader, it is nevertheless illustrated with enough graphs and tables to show the chief elements of technique and to give dependable evidence of the validity of the derived results. An example of the dependability of the

[1] Raymond Franzen, *An Evaluation of School Health Procedures*. School Health Research Monographs, No. V. New York: American Child Health Association, 1933. Pp. xii+128.

study is the fact that a triple-selection method was used in choosing the items of procedure. This threefold critical analysis reduced the number of items from 827 to 169.

The reviewer's only adverse criticism of the technique concerns the fact that only seventy schools were embraced in the study. Probably this number is sufficiently large in the case of most of the analyses, but in a few cases doubt arises concerning the use of so small a sampling. For instance, among the devices used by schools, the item "Lectures by doctors" is listed among "Devices the Absence of Which Is Associated with Better Results on Health Tests" (p. 81), as is also the device "Modern Health Crusade." Previously the statement is made that "these are practices the presence of which is significantly associated with poor health results" (p. 80). While not defending these particular practices, the reviewer is inclined to wonder how they can be causally related to the phenomenon of poor health results in the schools and whether a greater sampling of schools —say, two or three hundred—would not certainly shift these items to the other side of the comparison or at least negate the significance of their present position. However, the entire study is an example of such a thorough, impartial, and objective research that it must surely point the way to better methods of school-procedure analysis in the future.

Some conclusions drawn from the study are of particular interest and meaning. In the first place, teacher efficiency in diagnosis is low, the teachers failing to show awareness of pupil health needs; but the teachers' accuracy (that is, their ability to diagnose correctly a condition when it has been brought to their attention) is relatively high. In the second place, while teachers "have knowledge of only a very small proportion of the cases that are in definite need of professional attention, there is definite evidence that the teacher is able to perform a very useful function in initiation and reference" (p. 19). The "teacher could be so trained that her suspicions about teeth, vision, hearing, and nutritional status could be relied upon as definite evidence that the child needed a thorough examination" (p. 69).

The author goes on to say that technical knowledge as such does not appear to be a distinctive need on the part of the teacher; rather, her "methods of teaching, manner of approach, [and] knowledge of children" (p. 75) appear to be the vital factors in good health procedure. Present status of such knowledge and method, on the part of both the teacher and the nurse, is low, he declares, as is also the teacher's acquaintance with authoritative books and journals in the field.

In summary, it may be stated that the book is indicative of a definite advance in the professional and scientific treatment of curriculum analysis and procedure evaluation. It is exhaustive within its area of investigation. The results of the study are clear, definite, and of unquestioned value for the teacher or the administrator who is interested in the improvement of the program of health education within the school.

DOUGLAS E. LAWSON

Nutrition study in the elementary school.—Most teachers in the elementary school recognize the value of instruction in nutrition, but many keenly feel the need of help in giving such instruction. A volume has recently appeared that gives promise of providing needed subject matter as well as a method of using such materials of teaching.[1]

The content of the volume is divided into thirty-three chapters or lessons, built around such interesting titles as "Why We Need Food," "Foods That Furnish Grow-Material," "Foods That Furnish Go-Material." The introductions or previews are well developed, and the lessons are followed by exercises to be worked out by the pupils. Many teachers will want to increase the number of exercises, however, as not enough are provided to secure the degree of mastery desired.

The method of presentation is implied in the title of the book. After a brief introduction the overview or presentation is "broadcast" and used as a basis for class discussion and the working of exercises. This feature of the book might prove either advantageous or disadvantageous. If broadcasting is yet a novelty to the children, the method would prove to be a stimulating factor. On the other hand, if the children are no longer thrilled by the radio or if the use of the method should "get old" to them, the method, so intimately a part of the volume, might become monotonous and fail to be the motivating force anticipated.

The possibility that the method of presentation here included might prove a disadvantage emphasizes the contention made by some that curriculum materials should not be combined with methods of presentation. The splendid, thought-provoking content material given would be difficult to use with any other method of presentation. Another disadvantage is found in the fact that the book contains some material intended only for the teacher. The text is for the pupils and might well contain directions for study, but pupils are not interested in the teacher's procedures. Why can't textbooks be written for children and separate books be prepared for the teachers? In the introductory portion of this book are five pages "For the Teacher To Read"; on page 11 is a footnote of eight lines addressed "To the Teacher"; and in the Appendix are two pages of "Suggestions to the Teacher on Weighing and Measuring." If an introductory note addressed to the pupils had been substituted for the pages "For the Teacher To Read," the pupils could have been challenged, methods of study could have been given, and the presence of the glossary pointed out. Perhaps these objections are too general in character to be applied to a specific book.

There is one specific point to which the reviewer desires to call attention. The authors state: "We had always supposed that the Japanese were a smaller race than Europeans and Americans; we had thought that they were just born to be smaller; but when Japanese children in the United States were examined, they were found to be taller and heavier than Japanese children in Japan"

[1] J. Mace Andress and I. H. Goldberger, *Broadcasting Health.* Boston: Ginn & Co., 1933. Pp. x+402. $0.80.

(p. 20). The exact truth of this quotation is not questioned, but the implication is. The quotation is introduced by a reference to a need for plenty of good food and to the fact that the farmer is "careful that his pigs, chickens, and colts are well fed." Any rural child knows full well that no matter what he feeds a Hampshire pig, it will never develop into as large a hog as a Poland China pig, as carefully fed, might become; he also knows that, no matter what he feeds a bantam chick, it will never weigh as much as a plymouth rock chick may weigh in time. The author's purpose is to lead the children to a desire for plenty of well-selected food. The illustration may achieve the desired results in some instances, but the children are going to have to unlearn something later on. The children are also going to learn ultimately that some of them will not be six feet tall and weigh 185 pounds no matter what they eat.

The foregoing comments should not lead the reader to feel that the book has no merit. Some splendid content materials are presented which should prove valuable to elementary teachers. A separate book giving more detailed directions to teachers on how to prepare for each lesson would make the volume much more useful.

CLEM O. THOMPSON

An answer to Robert H. Lane.—In the December, 1933, number of the *Elementary School Journal* appeared a letter from Mr. Robert H. Lane, in which he took exception to statements made by Professor Henry Harap in a review of the book *A Teacher's Guidebook to the Activity Program.* Professor Harap has written us the following letter with reference to this review, which we are quoting with his permission.

I have checked Mr. Lane's refutation of my statement that his conception of activity is somewhat narrow, and I have found no cause to withdraw that statement. There is only one citation that suggests a broader conception; but that refers to a summary paragraph to chapter i which I may have overlooked. I had read the remainder of his citations and had taken them into consideration in arriving at my conclusion that his conception of an activity is somewhat narrow.

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Charters and Basic Laws of Selected American Universities and Colleges. Compiled and edited by Edward C. Elliott and M. M. Chambers. New York:

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GOOD, WARREN R. *The Elements of Statistics:* A Simple Introductory Course. Ann Arbor, Michigan: Ann Arbor Press, 1933. Pp. 28. $0.50.

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